SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Joseph J. Pierrattee
Fla. Crushed Stone
10311 Cement Plant Rd
Brooksville, Fl 34601

4a. Article Number
Z 127 632 574

4b. Service Type
☐ Registered ☐ Insured
☑ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
11/21/95

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form 3811, December 1991 *U.S. GPO: 1993—352-714 DOMESTIC RETURN RECEIPT

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

Z 127 632 574

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to
Joe Pierrattee
Street and No.
Fla Crushed Stone
P.O., State and ZIP Code
Brooksville, Fl

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	11-17-95

AC 27-274892
PSD-FI-227

PS Form 3800, March 1993

State of Florida
Department of Environmental Protection
Notice of Permit

In the matter of an
Application for Permit by:

DEP File No. AC 27-274892
PSD-FL-227
Hernando County

Mr. Joseph T. Piermatteo, Sr. Vice President
Florida Crushed Stone Company
10311 Cement Plant Road
Brooksville, Florida 34601

Enclosed is Permit Number AC 27-274892 (PSD-FL-227) to construct a second 83 ton per hour cement plant. The project includes a dry process kiln with a preheater, clinker cooler, curshers, raw mill, finish mill, material and fuel handling equipment, silos, and shipping facilities. The facility is located approximately 3.5 miles northwest of Brooksville, Hernando County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 14 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this **NOTICE OF PERMIT** and all copies were mailed by certified mail before the close of business on 11-17-95 to the listed persons.

Clerk Stamp
FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk 11-17-95
Date

Copies furnished to:

cc: Jewell Harper, EPA
John Bunyak, NPS
Buck Oven, DEP
Bill Thomas, SWD
Doug Beason, DEP
Lawrence Jennings, Hernando County
Don Elias, RTP Env. Assoc.
Lawrence Curtin, H&K
Tom Mountain, FCS

FINAL DETERMINATION

Florida Crushed Stone
PSD-FL-227
AC 27-274892
Hernando County

Florida Crushed Stone's application for a permit to construct a second portland cement kiln with a maximum clinker production capacity of 83 tons per hour (TPH) and associated equipment consisting of a clinker cooler, Gepol preheater, raw mill, finish mill, conveyers, transport systems, feed systems, and raw material and product silos, bins, and hoppers at their facility in Brooksville, Hernando County was reviewed by the Bureau of Air Regulation in Tallahassee. The Technical Evaluation and Preliminary Determination for the permit was distributed on October 3, 1995. The Notice of Intent was published in the Tampa Tribune on October 6, 1995. Copies of the evaluation were available for inspection at the Department's offices in Tampa and Tallahassee as well as at the Hernando County Planning Department.

No adverse comments were submitted by either the U.S. Department of Interior or the U.S. Environmental Protection Agency.

Comments regarding the Best Available Control Technology (BACT) Determination and the Specific Conditions of the proposed permit were submitted by Mr. Don Elias of RTP Environmental Associates on behalf of Florida Crushed Stone (FCS) in a letter dated October 24, 1995. The Department held a meeting with FCS to discuss the issue of the Best Available Control Technology (BACT) Determination for nitrogen oxides (NOx) with which FCS disagreed. The Bureau has considered the technical arguments presented by FCS as well as Mr. Elias' comments and made the changes discussed below.

The requested revisions of the specific conditions of the permit are discussed and the Department's response and any changes agreed to are as follows:

DEP PERMIT NUMBER PSD- FL-227

A. SPECIFIC CONDITION #4

FCS/RTP COMMENTS:

Indicate that shredded tires, also known as tire-derived fuel (TDF) and natural gas, may be fired during normal operation. Indicate that all grades of virgin fuel oil and blends of virgin fuel oil and on-spec used oils may be fired during startup.

DEPARTMENT'S RESPONSE:

Burning of tires was already approved. The Department agrees that TDF may also be fired. Natural gas may also be fired during normal operation. Department did not intend to restrict firing of virgin fuel oil by itself. The changes/clarifications will be made as recommended by FCS as follows:

FROM:

4. Fuels fired in No. 2 kiln shall not exceed a total heat input rate of 303 MMBtu/hr and shall consist only of:

a. Coal and whole tires for normal operation.

b. Natural gas and blends of unused No. 2 fuel oil and on-spec used oils for startup.

TO:

4. Fuels fired in No. 2 kiln shall not exceed a total heat input rate of 303 MMBtu/hr and shall consist only of:

a. Coal and whole tires, **tire derived fuel (shredded tires), and natural gas** for normal operation.

b. Natural gas, **all grades (meeting 1.5 % sulfur limit) of virgin fuel oil, and/or** and blends **(meeting 1.5 % sulfur limit)** of **virgin** fuel oil and on-spec used oils for startup.

B. SPECIFIC CONDITION #5

FCS/RTP COMMENTS

Remove sulfur limit for coal as had been previously done in kiln No. 1.

DEPARTMENT'S RESPONSE:

The Department included an emission limit based on SO_2 emissions per ton of clinker produced. Sulfur dioxide emissions are apparently not very sensitive to the sulfur content in the coal but rather to the balance between alkali and sulfur in the kiln feed and kiln operating conditions. The continuous emission monitoring system will insure compliance with the sulfur dioxide emission standard. The Department will remove the coal sulfur limit as follows:

FROM:

5. The maximum sulfur content of the coal fired in the No. 2 kiln shall not exceed 0.76% sulfur by weight. The coal usage rate shall not exceed 10.3 TPH or 90,228 TPY based on continuous operation. The coal sulfur content shall be determined using ASTM Method D-2234, D-3173, D-3176, D-3177 or D-4239.

TO:

5. The coal usage rate shall not exceed 10.3 TPH or 90,228 TPY based on continuous operation.

C. SPECIFIC CONDITION #6

FCS/RTP COMMENTS:

Indicate that TDF may be fed continuously at the kiln inlet.

DEPARTMENT'S RESPONSE:

Feeding of tires was already approved. The Department agrees that feeding of TDF is also allowed and will make the change as recommended by FCS as follows:

FROM:

6. Whole tires fired may be fed continuously at the kiln inlet at the base of the preheater at a rate not to exceed 45 MMBtu/hr (15% of total kiln fuel input) or 1.33 TPH and 11,039 tons per year based on 8300 hours per year.

TO:

6. Whole tires **and tire derived fuel** may be fed continuously at the kiln inlet at the base of the preheater at a rate not to exceed 45 MMBtu/hr (15% of total kiln fuel input) or 1.33 TPH and 11,039 tons per year based on 8300 hours per year.

D. SPECIFIC CONDITION #7

FCS/RTP COMMENTS:

FCS indicated that condition would require an instantaneous jump in kiln gas exit temperature from 1400°F to 1750°F, did not give an averaging time and is not a requirement for existing kiln No. 1.

DEPARTMENT'S COMMENTS:

The Department has data to show that the kiln exhaust gas temperature of 1750°F can readily be met in a preheater-type kiln. A high temperature is considered necessary by the Department to insure destruction of dioxins and furans which could be formed by the interaction between organic materials in the tires and chlorides present in the recirculating gas. The Department will not delete the requirement until evidence of virtually complete dioxins destruction is presented from tests or literature references for kilns burning tires in the manner and at the temperatures planned by FCS. Additionally, the ability to maintain these temperatures, will preserve the options available to FCS for achieving the nitrogen oxides limits set by the Department and agreed to by FCS. However, the Department will modify the condition as follows:

FROM:

7. Before initiating tire firing, the gases exiting the kiln ahead of the preheater shall reach a minimum temperature of 1400 degrees F for one hour and the oxygen level in the kiln, as measured at the cement plant induced draft fan, shall reach at least 3 percent (1-hour average). Thereafter, gases exiting the kiln shall be maintained at an outlet temperature of 1750 degrees F.

TO:

7. Before initiating tire firing, the gases exiting the kiln ahead of the preheater shall reach a minimum temperature of 1400 degrees F for one hour and the oxygen level in the kiln, as measured at the cement plant induced draft fan, shall reach at least 3 percent (1-hour average). **Upon reaching steady state conditions, and within 6 hours**, gases exiting the kiln shall be maintained at an outlet temperature of at least 1750 degrees F.

E. SPECIFIC CONDITION #10

FCS/RTP COMMENTS:

No comments except that FCS included a condition (related to test methods for use on-spec fuel oil) in a related document (Florida Site Certification PA 82-17E) which the Department overlooked in the PSD permit.

DEPARTMENT COMMENTS:

Department intended to include the conditions which were overlooked and amends Specific Condition 10 as follows:

FROM:

10. The on-spec used oil to be blended with the unused fuel oil in the cement kiln fuel storage tank shall be obtained only from the used oil storage tanks located at the FCS Greg Mine and CPL Plant.

TO:

10. The on-spec used oil to be blended with the unused fuel oil in the cement kiln fuel storage tank shall be obtained only from the used oil storage tanks located at the FCS Greg Mine and CPL Plant. **The used oil sample from Specific Condition No. 12 shall be analyzed for the following constituent/property, associated unit, and using the test methods indicated:**

Constituent/Property	Unit	Test Method
Cadmium	ppm	EPA SW-846(6010)
Arsenic	ppm	EPA SW-846(6010)
Chromium	ppm	EPA SW-846(6010)
Lead	ppm	EPA SW-846(6010)
Total Halogens	ppm	EPA SW-846(9252)
Sulfur	percent	ASTM D129 or ASTM D1552
Flash Point	Degree F	EPA SW-846(6010)
Heat of Combustion	Btu/gal	EPA SW-846(1010)
Density	lbs/gal	ASTM D240
Polychlorinated Byphenyls (PCB's)	ppm	

NOTE: Other test methods may be used only after receiving written prior approval from the Department.

F. SPECIFIC CONDITION #12/TABLE II

FCS/RTP COMMENTS:

FCS indicated that proposed nitrogen oxide (NO_X) BACT limit of 2.5 pounds per ton of clinker (lb/ton clinker) is too stringent particularly with continuous monitoring and a 24-hour standard. The kiln manufacturer, Polysius, would not guarantee a NO_X limit less than approximately 4 lb/ton clinker, nor would they agree to a guarantee for the performance of their system (including quality of cement) in conjunction with Selective Non-Catalytic Reduction (SNCR). FCS claims that SNCR has not in fact been demonstrated for a "preheater type" kiln such as the one planned by FCS.

DEPARTMENT COMMENTS:

The Department accepts that SNCR has not been demonstrated on a preheater type kiln. However the Department rejects the manufacturer's claims that it cannot guarantee a lower NO_x limit than 4 lb/ton clinker.

On the basis of tests conducted at a preheater type kiln (Southdown) in Brooksville, it is the conclusion that the new FCS kiln can meet a limit of 2.8 lb/ton clinker on a 24-hour basis. The proposed limit was agreed to by FCS without concurrence by Polysius. FCS still considers it to be "aggressive." Thus Table II is amended as follows:

FROM:

	BACT EMISSION LIMIT		EMISSION RATE		BASIS
POLLUTANT	lb/ton clinker	lb/ton dry feed	lbs/hr	tons/yr	
NO_x	2.500	1.634	207.5	908.850	BACT

TO:

	BACT EMISSION LIMIT		EMISSION RATE		BASIS
POLLUTANT	lb/ton clinker	lb/ton dry feed	lbs/hr	tons/yr	
NO_x	**2.8**	**1.83**	**232.4**	**1018**	BACT

G. SPECIFIC CONDITION #13/TABLE I

FCS/RTP COMMENTS:

FCS indicated that the draft permit gives minor sources visibility (and grain loading) limits instead of mass emission limits. FCS wishes to rely on compliance with the visibility limits as indication that these emission points also comply with the grain loading requirements.

DEPARTMENT COMMENTS:

The Department agrees with FCS's comment and recognizes, on the basis of Rule 62-297.620(4), waiver of particulate compliance test requirements for minor particulate emission points equipped with baghouses which meet a 5 percent opacity limitation. Specific Condition 13 is amended as follows:

FROM:

13. The permittee shall not cause or allow to be discharged into the atmosphere visible emissions which exceed the limits listed in Table I.

TO:

13. The permittee shall not cause or allow to be discharged into the atmosphere visible emissions which exceed the limits listed in Table I. In accordance with Rule 62-297.620(4), minor particulate sources equipped with baghouses with visible emissions which are greater than or equal to 5 percent opacity shall require the permittee to perform a stack test in accordance with approved methods to verify compliance with the 0.01 gr/dscm emission limit contained in Table I.

H. SPECIFIC CONDITION #34

FCS/RTP COMMENTS:

FCS indicated that the requirement to stop feeding tires when any emission limits will not necessarily remedy and may worsen the situation.

DEPARTMENT COMMENTS:

The Department agrees with FCS and will rely on compliance procedures and rule provisions (Rules 62-210.700) related to excess emissions and malfunctions to insure the emissions limits are met while leaving it to FCS to determine the best way to remedy emission limit exceedances. Therefore, Specific Condition 34 is deleted as shown below.

~~34. In the event of any malfunction resulting in failure of emission control equipment or any malfunction of process equipment resulting in kiln emissions exceeding limits set forth in Tables I and II, the operator shall immediately stop the feeding of tires into the kiln and shall not resume the firing of tires until the emission control equipment has been put into proper working order. [Rules 62-212.200(58), 62-212.200(107)].~~

Conclusion:

The final action of the Department is to issue the federal construction permit, PSD-FL-212 and the State Air Construction Permit, AC 27-274892 with the changes noted above.

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

PERMITTEE:
Florida Crushed Stone Company
10311 Cement Plant Road
Brooksville, FL 34601

Permit Number: AC 27-274892
PSD-FL-227
Expiration Date: 11/30/98
Project: No. 2 Cement Kiln and Associated Equipment

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4, 62-210 through 297. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the construction of a second portland cement kiln a maximum clinker production capacity of 83 tons per hour (TPH) and associated equipment consisting of a clinker cooler, Gepol preheater, raw mill, finish mill, conveyers, transport systems, feed systems, and raw material and product silos, bins and hoppers. The cement kiln will be preheated with fuel oil and/or natural gas, fired with coal as the main fuel, and burn whole tires as supplemental fuel.

The Florida Crushed Stone (FCS) facility is located approximately 3.5 miles northwest of Brooksville, Hernando County, Florida. The UTM coordinates of this facility are Zone 17, 360.0 km East and 3162.5 km North.

The project shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application received March 13, 1995.
2. Department's letters dated April 21, memo dated June 16, letter dated August 3, August 10, and October 11, 1995.
3. RTP Environmental Associates letters dated March 21, May 10, May 19, July 11, July 17, August 11, August 22, September 5, September 7, September 12, September 14, and October 24, 1995.
4. EPA's letters dated June 15, and November 2, 1995.
5. Hernando County Planning Department's letter dated April 28, June 5, and August 11, 1995.

GENERAL CONDITIONS:

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.

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, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any 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 of 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.

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.

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.

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.

GENERAL CONDITIONS:

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 any 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.

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.

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.

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.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance,

GENERAL CONDITIONS:

provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, 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.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

(x) Determination of Best Available Control Technology (BACT) - **Attached and made a condition of this permit**
(x) Determination of Prevention of Significant Deterioration (PSD)
(x) Compliance with New Source Performance Standards (NSPS)

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 for 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:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;

GENERAL CONDITIONS:

- the analytical techniques or methods used; and
- the results of such analyses.

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.

SPECIFIC CONDITIONS:

1. The construction and operation of the No. 2 kiln and associated equipment shall comply with all applicable provisions of Chapter 403, F.S., Chapters 62-4, 62-210 through 297, F.A.C., and 40 CFR 60 (1994 version).

2. Unless otherwise indicated, the construction and operation of the No. 2 cement kiln and associated equipment shall be in accordance with the capacities and specifications stated in the application. The facility shall comply with all applicable requirements of 40 CFR 60, Subpart A, Appendix A and Appendix B (1994 version); Subpart F - Standards of Performance for Portland Cement Plants which are adopted by reference in Rule 62-296.800(2)(a), F.A.C.

3. The No. 2 kiln clinker production rate shall not exceed 83.0 tons per hour (TPH), 1992 tons per day (TPD) and 727,080 tons per year (TPY) based upon 8,760 hours of operation per year.. The permitted maximum preheater feed is 138.0 TPH, which is equivalent to a maximum kiln feed rate of 127.0 TPH. [Rule 62-212.200(58), F.A.C.]

4. Fuels fired in No. 2 kiln shall not exceed a total heat input rate of 303 MMBtu/hr and shall consist only of:

a. Coal and whole tires, tire derived fuel (shredded tires), and natural gas for normal operation.

b. Natural gas, all grades (meeting 1.5% sulfur limit) of virgin fuel oil, and/or and blends (meeting 1.5% sulfur limit) of virgin fuel oil and on-spec used oils for startup.

5. The coal usage rate shall not exceed 10.3 TPH or 90,228 TPY based on continuous operation.

6. Whole tires and tire derived fuel may be fed continuously at the kiln inlet at the base of the preheater at a rate not to exceed 45 MMBtu/hr (15% of total kiln fuel input) or 1.33 TPH and 11,039 tons per year based on 8300 hours per year.

7. Before initiating tire firing, the gases exiting the kiln ahead of the preheater shall reach a minimum temperature of 1400 degrees F for one hour and the oxygen level in the kiln, as measured at the cement plant induced draft fan, shall reach at least 3 percent (1-hour average). Upon reaching steady state conditions, and within 6 hours, gases exiting the kiln shall be maintained at an outlet temperature of at least 1750 degrees F.

8. The sulfur content of the fuel oil blend shall not exceed 1.5% by weight. The constituents and properties of the on-spec used oil shall comply with the following allowable concentration levels, as stipulated and defined in 40 CFR 266.40 (July 1, 1992 version), which is adopted by reference in Rule 62-730.181, Florida Administrative Code (F.A.C.):

Constituent/Property	Allowable Concentration
Cadmium	2 ppm maximum
Arsenic	5 ppm maximum
Chromiun	10 ppm maximum
Lead	100 ppm maximum
Total Halogens	1000 ppm maximum
Flash Point	140 F minimum
Polychlorinated Byphenyls (PCBs)	Less than 2 ppm

9. On-spec used oil to be blended and burned at this facility shall not be a hazardous waste as defined by Rule 62-730.030, F.A.C., or 40 CFR Part 261 (July 1, 1992 version). It shall not include fuels or blended fuels consisting in whole or in part of hazardous waste or which include mixture of any solid waste generated from the treatment, storage, or disposal of hazardous waste. The on-spec used oil shall be burned in compliance with Section 403.769(3), Florida Statutes.

10. The on-spec used oil to be blended with the unused fuel oil in the cement kiln fuel storage tank shall be obtained only from the used oil storage tanks located at the FCS Greg Mine and CPL Plant. The used oil sample from Specific Condition No. 12 shall be analyzed for the following constituent/property, associated unit, and using the test methods indicated:

Constituent/Property	Unit	Test Method
Cadmium	ppm	EPA SW-846(6010)
Arsenic	ppm	EPA SW-846(6010)
Chromium	ppm	EPA SW-846(6010)
Lead	ppm	EPA SW-846(6010)
Total Halogens	ppm	EPA SW-846(9252)
Sulfur	percent	ASTM D129 or ASTM D1552

Flash Point	Degree F	EPA SW-846(6010)
Heat of Combustion	Btu/gal	EPA SW-846(1010)
Density	lbs/gal	ASTM D240
Polychlorinated Byphenyls (PCB's)	ppm	

NOTE: Other test methods may be used only after receiving written prior approval from the Department.

11. The maximum on-specification used oil concentration in the final storage tank blend of on-specification used oil and purchased unused oil shall not exceed 15 percent by volume.

12. The maximum allowable emission rates for the No. 2 kiln, clinker cooler, raw mill and preheater shall not exceed the limits listed in Table II.

13. The permittee shall not cause or allow to be discharged into the atmosphere visible emissions which exceed the limits listed in

Table I. In accordance with Rule 62-297.620(4), minor particulate sources equipped with baghouses with visible emissions which are greater than or equal to 5 percent opacity shall require the permittee to perform a stack test in accordance with approved methods to verify compliance with the 0.01 gr/dscf emission limit contained in Table I.

14. Compliance with the allowable emission limiting standards listed in Tables I and II shall be determined within 60 days after achieving the maximum production rate at which this plant will be operated, but not later than 180 days of initial operation, and annually (where specified) thereafter, by using the following reference methods as described in 40 CFR 60, Appendix A (1994 version) and 40 CFR 61 Appendix B 1994 version) adopted by reference in Chapter 62-297, F.A.C.

Method 5 Determination of Particulate Matter Emissions from Stationary Sources (I) and (A).
Method 8 Determination of Sulfuric Acid Mist from Stationary Sources (I).
Method 9 Visual Determination of the Opacity of Emissions from Stationary Sources (I) and (A).
Method 10 Determination of Carbon Monoxide Emissions from Stationary Sources (I) and (A).
Method 22 Visual Determination of Fugitive Emissions from Material Sources (I) and (A).
Method 25 Determination of Volatile Organic Compound Emissions from Stationary Sources (I).

Method 29 Determination of Lead, Cadmium, and Mercury from Stationary Sources (proposed) (I).
Method 104 Determination of Beryllium Emissions from Stationary Sources (I).

15. Emission testing shall be performed at the No. 2 kiln/cooler stack during a period when the No. 2 kiln, cooler, raw Mill and preheater are operating simultaneously and under normal operating conditions. The measured emission rates will be the combined rates from the kiln and clinker cooler determined at the stack. The Initial (I) compliance test shall be performed within 180 days of start up. Annual (A) compliance tests shall be performed during every federal fiscal year (October 1 - September 30) pursuant to Rule 62-297.340, F.A.C.

16. EPA-reference methods for sampling pollutants shall consisting of 3 consecutive test runs, each of one hour duration, shall be performed on the common kiln/cooler stack for each pollutant specified in Tables I and II.

17. Stack sampling facilities shall be installed in accordance with Rule 62-297.345, F.A.C.

18. The DEP may request a special compliance test pursuant to Rule 62-297.340(2), F.A.C., when, after investigation (such as complaints, increased visible emissions, or questionable maintenance of control equipment), there is reason to believe that any applicable emission limit is being violated.

19. The Department's Southwest District office shall be notified 30 days prior to any compliance test to allow witnessing. Results of the tests shall be submitted to the Department's Southwest Florida District office within 45 days after testing.

20. Testing of emissions shall be conducted with the emission unit operating at capacity (85% coal and 15% tires). 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 unit 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 unit is so limited, then operation at higher capacities is allowed for no more than fifteen consecutive days for the purpose of additional compliance testing to regain the permitted capacity in the permit.

21. Continous monitoring equipment shall be installed, operated, and used to determine compliance for NOx and SO2. Continuous emission monitors must be installed and certified, before the

initial performance test, and operated in compliance with 40 CFR 60, Appendix F, Quality Assurance Procedures (1994 version) or other Department approved QA plan; 40 CFR 60 Appendix B, Performance Specification 1, 2, and 3 (1994 version).

22. Continuous opacity monitors shall be installed, operated, and maintained at the common kiln/cooler stack pursuant to 40 CFR 60.63.

23. Continuous monitors shall be installed for CO or O_2 to insure proper combustion practices and for use in determining plant operating parameters to optimize emissions of CO, NO_x, and SO_2.

24. Reasonable precautions to prevent fugitive particulate emissions during construction, such as coating of roads and construction sites used by contractors, and regrassing or watering areas of disturbed soils, will be taken by the permittee. These provisions are applicable to any source, including but not limited to vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrial related activities such as loading, unloading, storing and handling. At all times, unconfined particulate matter emissions shall be minimized by dust suppressing techniques, such as covering and/or application of water or chemicals to the affected areas pursuant to Rule 62-296.310(3), F.A.C.- Unconfined Emissions of Particulate Matter.

25. Particulate emissions from coal handling facilities related to the No. 2 kiln shall be minimized by following the procedures listed below: [Rule 62-296.310(3)]

a. All conveyers and transfer points shall be enclosed to preclude particulate emissions (except those directly associated with coal stacking/reclaiming).

b. Coal storage piles shall be shaped, compacted and oriented to minimize wind erosion.

c. Water sprays or chemical wetting agents and stabilizers shall be applied to storage piles, handling equipment, etc, during dry periods and as necessary to all facilities to maintain an opacity of less than 5 percent, except when adding, moving or removing coal from the coal pile, during which the opacity shall be no more than 20%.

26. The part of the fly ash handling system related to the No. 2 kiln (including transfer equipment, flyash bin, and pneumatic system exhaust) will be totally enclosed and vented through fabric filters.

27. In order to document compliance with Specific Condition No. 6:

a. A log shall be established and maintained for the hours of operation using tires as supplemental fuels. The log shall include the daily tire usage (hours) as supplemental fuel at the facility, a monthly running total of the tire usage (hours), and a cumulative 12 month running total (hours), 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.

b. A log that includes the date of all tire deliveries to the facility, and the total quantity (nearest 0.1 tons) of tires received.

c. A tire usage-control system shall be installed to assure that the tire usage as supplemental fuel at the facility does not exceed the maximum 15% of the total Btu heat input to the No. 2 kiln or 1.33 tons per hour. The control system shall include a verification method and a log that insures and documents that the tires usage and heat input limits are not exceeded.

d. A log for the utilization rate (tons per hour) of tires. The utilization rate of tires as supplemental fuel shall be determined by a continuous weighing method and shall be recorded.

e. The logs shall be maintained on file for at least five (5) years and shall be made available to the Department upon request.

28. FCS shall record, as a minimum, the daily dry feed rate into the No. 2 kiln (TPH), and the clinker production rate. The above records shall be retained for a period of five (5) years and made available to the Department upon request.

29. In order to document compliance with Specific Condition No. 5, a coal usage control system shall be established to assure that the coal usage does not exceed a maximum of 10.3 TPH.

30. In order to document compliance with Specific Conditions No. 8 through 11, the following used oil control system shall be used, as a minimum:

a. Record the transfer of used oil and unused oil to the blend tanks (dates and gallons).

b. Record the final blend quantities of on-spec used oil and unused oil (gallons)

c. Calculate and record the final percentage of on-spec used oil in the tank blend of on-spec used oil and unused oil, and verify that the percentage does not exceed 15.0 percent, by volume.

These records shall be maintained on file for at least five (5) years and shall be made available to the Department upon request. [Rule 62-4.070(3), F.A.C. and FCS letter on Used Oil Sampling].

31. Recordkeeping requirement when burning on-spec used oil shall be in accordance with 40 CFR 266.43 (b) and (6) (July 1, 1992 version). The results of each sample analysis shall be submitted to the Department Southwest District office and the Hernando County Planning offices within 30-days after a sample is taken. The dates and quantities of both on-spec purchased fuel oil transferred to the facility storage tank shall be reported quarterly (i.e., Jan-Mar, April-June, July-Sept, and Oct-Dec). The report is due in the month following the ending quarter. All records shall be kept for a minimum of five (5) years period for public and regulatory agency inspection.

32. All measurements, records, and other data required to be maintained by the permittee shall be reported to the Southwest District office on a quarterly basis with the start of commercial operation in accordance with 40 CFR 60.7. All measurements, records and other data required to be maintained by the permittee shall be retained for at least 5 years following the date on which such measurements, records, or data are recorded. The data shall be available to Department staff as requested. [40 CFR 60.7]

33. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting requirements and regulations (Rule 62-210.300(1), F.A.C.).

35. Objectionable odors associated with air emissions from this facility shall be prohibited. [Rule 62-296.320]

36. Pursuant to Rule 62-210.370(2), F.A.C., Annual Operating Reports, the permittee is required to submit annual reports to the Southwest District office by March 1 of each calendar year, on the actual operating rates and emissions from this facility. These reports shall include at a minimum the following:

a. the input process rate

b. total quantity (by weight) of tire used as supplemental fuel.

c. total coal, natural gas, and oil usage, and

d. regulated pollutant emission rates.

37. The permittee may, for good cause, request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit. However, the permittee shall promptly notify the Southwest District office of any delays in completion of the project which would affect the startup date by more than 90 days. [Rule 62-4.090, F.A.C.].

38. An application for an operation permit must be submitted to the DEP's Southwest District office at least 90 days prior to the expiration date of this construction permit. To properly apply for an operation permit, the permittee shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (Rules 62-4.055 and 62-4.220, F.A.C.).

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources Management

Table I
Allowable Opacity Limits

Description	Control	Emission Unit Equipment	Grain Loading (gr/dscf)	OPACITY
Emission Unit: Raw Material Processed Process Rate				
Material Processing (Fugitive)				10
Handling and Storage (Fugitive)				10
Emission Unit: Raw Mill System Process Rate = 127 TPH Dry Feed				
Iron Ore Bin	Baghouse	2D-61	0.01	5
Fly Ash Bin	Baghouse	2D-64	0.01	5
Filter Dust Bin	Baghouse	2D-72	0.01	5
Raw Meal Transport	Baghouse	2F-03	0.01	5
Limo Silo Storage	Baghouse	2F-21	0.01	5
Raw Mill Storage and Homogenizing Silos	Baghouse	2T-01	0.01	5
Emission Unit: Kiln Operations Process Rate = 303 MMBTU/hr				
Kiln Feed System	Baghouse	2H-05, 2E-66	0.01	5
Kiln Main Stack	Baghouse	2E-40		10
Emission Unit: Finish Mill Process Rate = 83 TPH Clinker				
Gypsum Storage Bin	Baghouse	2L-14	0.01	5
Clinker Transport	Baghouse	2L-03	0.01	5
Belt Conveyor	Baghouse	2M-08	0.01	5
Finish Mill Discharge Vent	Baghouse	2N-02	0.01	5
Finish Mill Sepal Separator	Baghouse	2N-08	0.01	5
Emission Unit: Cement Handling Process Rate: ~ 90 TPH Portland Cement				
Cement Storage Silo A	Baghouse	2Q-01, 2Q-20	0.01	5
Cement Storage Silo B	Baghouse	2Q-01, 2Q-20	0.01	5
Cement Silo Discharge Hopper	Baghouse	2Q-01, 2Q-20	0.01	5
Emission Unit: Coal Handling Process Rate = 10.3 TPH				
Coal Transport Conveyor	Baghouse	2S-03	0.01	5
Coal Storage Bin	Baghouse	2S-01	0.01	5
Coal Handling and Storage (Fugitive)				5/20

Table II
Allowable Emissions
Main Stack

POLLUTANT	BACT EMISSION LIMIT		EMISSION RATE		BASIS
	lb/ton clinker	lb/ton dry feed	lbs/hr	tons/yr	
PM/PM_{10} (kiln)	0.310	0.200	25.400	111.250	BACT
PM/PM_{10} (cooler)	0.150	0.100	12.700	55.620	BACT-NSPS
SO_2	0.270	0.176	22.410	98.156	BACT
NO_x *	2.800	1.830	232.400	1017.912	BACT
CO	2.000	1.307	166.000	727.080	BACT
VOC	0.100	0.065	8.300	36.354	FCS/DEP
H_2SO_4	0.014	0.009	1.162	5.090	FCS DATA
Beryllium	9.90E-07	6.47E-07	8.22E-05	3.60E-04	FCS/DEP
Mercury	2.40E-05	1.57E-05	1.99E-03	8.72E-03	FCS DATA
Lead	5.20E-04	3.40E-04	4.32E-02	1.89E-01	FCS DATA

Note: * FCS shall have up to 18 months after startup of commercial operation to achieve this standard.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT) DETERMINATION
PORTLAND CEMENT PLANT
Florida Crushed Stone
PSD-FL-227 and AC 27-274892
Hernando County
(revised 11/9/95)

The applicant, Florida Crushed Stone Company (FCS), plans to construct an 83 ton per hour (maximum TPH as clinker) dry process portland cement kiln with a preheater design at its existing cement plant approximately 3.5 miles northwest of Brooksville, Hernando County, Florida. The project includes a single kiln and clinker cooler along with raw mill, finish mill, cement and clinker handling equipment, coal handling equipment, silos, and air pollution control equipment. The facility will produce 727,080 tons per year (maximum TPY as clinker) and approximately between 760,000 and 800,000 TPY of portland cement. A process description is included in the Technical Evaluation and Preliminary Determination.

Following is the BACT determination proposed by the applicant:

BACT Determination Requested by the Applicant:

POLLUTANT	EMISSION LIMIT
Particulate Matter (kiln)	0.3 lbs/ton of dry kiln feed
Particulate Matter (cooler)	0.1 lbs/ton of dry kiln feed
Particulate Matter (material handling, conveying, storage)	0.01 gr/dscf by baghouses
Sulfur Dioxide (Kiln)	0.55 lbs/ton clinker
Sulfuric Acid Mist (kiln)	0.014 lbs SO_3/ton clinker
Nitrogen Oxides (Kiln)	4.3 lbs/ton clinker
Carbon Monoxide (kiln)	1.0 lbs/ton dry kiln feed
Volatile Organic Compounds (kiln)	0.07 lbs/ton clinker
Beryllium	6.6×10^{-7} lbs/ton clinker
Lead	7.5×10^{-5} lbs/ton clinker

A single, large, fabric filter system (baghouse) will be used to capture particulate matter from the kiln and the cooler. Baghouses will also be used to limit particulate emissions from other process emission points. Table 1 is a list of the emission units to be controlled by baghouses.

Portland cement plants are among the major facilities listed in Florida Administrative Code (F.A.C.) Chapter 62-212, Prevention of Significant Deterioration (PSD), Table 212.400-1, "Major Facilities Categories." A BACT determination is required for each pollutant exceeding the significant emission rates in Table 212.400-2, "Regulated Air Pollutants Significant Emissions Rates," which in this case are particulate matter (PM), sulfur dioxide (SO_2), carbon monoxide (CO), and nitrogen oxides (NO_X).

This facility is also subject to:

- 40 CFR 60, Subpart F - Standards of Performance for Portland Cement Plants.
- 40 CFR 51, Subpart P - Protection of Visibility.

Date of Receipt of a BACT Application:

March 13, 1995

Review Group Members:

Teresa Heron, Marty Costello, and A. A. Linero of the New Source Review Section.

BACT Determination Procedure

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that, in making the BACT determination, the Department shall give consideration to:

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

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determination of any other state.

(d) The social and economic impact of the application of such technology.

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

The air pollutant emissions from this facility can be grouped into categories based upon the control equipment and techniques that are available to control emissions from these emission units. Using this approach, the emissions can be classified as follows:

- Combustion Products (e.g., SO_2, NO_x, PM). Controlled generally by good combustion of clean fuels, reactions with clinker and raw materials, removal in add-on control equipment.

- Products of Incomplete Combustion (e.g., CO, VOC). Control is largely achieved by proper combustion techniques.

- Emissions from materials handling, conveyance, and storage (primarily PM). Controlled generally by fabric filters and reasonable precautions.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "non-regulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., PM, SO_2, H_2SO_4, fluorides, etc.), if a reduction in "non-regulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

COMBUSTION PRODUCTS

Nitrogen Oxides (NOx)

Emissions of NO_x from dry process cement plants with a preheater include the kiln and any fuel-fired support operation. Oxides of nitrogen (NOx) are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel (fuel NOx) and by thermal fixation of nitrogen in the combustion air (thermal NOx). As flame temperature increases, the amount of thermally

generated NOx increases. Fuel type affects the quantity and type of NOx generated. Generally, natural gas is low in nitrogen. However it causes higher flame temperatures and generates more thermal NOx than oil or coal, which have higher fuel nitrogen content, but exhibit lower flame temperatures.

NO_X emissions represent a significant portion of the total emissions generated by this project, and must be minimized using BACT.

The emissions of NOx can potentially be reduced at Portland cement plants by two methods:

1. Minimizing the quantity of NOx generated during combustion (combustion modifications).

2. Reducing the quantity of NOx in the flue gas stream (flue gas controls).

A review of EPA BACT/LAER Clearinghouse (BACT Clearinghouse) information indicates that NO_X emissions at most facilities are minimized by process control and good combustion practices.

The applicant stated that NO_X emissions at this facility will be controlled through "proper combustion practices" such as burner design with primary combustion air control. Introduction of tires in the material feed end of the kiln will reduce the thermal load on the burner end and possibly result in lower NO_X emissions. In its original submittal, the applicant ruled out Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR) as technically infeasible or cost prohibitive.

The applicant gave subsequent consideration to other possible control methods following a request by the Department for additional details justifying the selected method. The applicant rejected Low NO_X Burners, Low Nitrogen Fuel, Flue Gas Recirculation, Fuel Reburning, and Contemporaneous Reductions from the on-site power plant and cement kiln as options which are ineffective, undemonstrated, or beyond the control of the applicant.

The Department requested that the applicant provide an expanded BACT analysis using the procedures described in the EPA New source Review Workshop Manual to show, at a minimum, a technical, economic, and environmental analysis of any applicable control technology. The applicant's response was that the "top" technology was selected for all pollutants and that the technical, economic, and environmental analyses were not required.

The applicant has proposed a NOx emission rate of 359 lb/hr and 4.3 lb/ton clinker. It is compared below with previous determinations documented by the BACT Clearinghouse.

Previous BACT Determinations

BASIS	Least Stringent	Most Stringent	Proposed
	Year 1978	Year 1981	Year 1995
lb/ton clinker	11.13	0.85	4.3

It is important to note that the facility which was given the 0.85 lb/ton clinker NO_X limit has not been able to meet it since construction. A dry process plant with preheater/precalciner received a NO_X limit of 1.11 lb/ton clinker but was never built. Another dry process plant with preheater and calcining loop received a BACT determination of 2.09 lb NO_X/ton clinker. However, it appears that since that time a less stringent standard was applied. Two other dry process preheater/precalciner plants (including proposed Florida Rock Industries Plant) received a NO_X value of 2.5 lb/ton clinker **(later revised to 2.8 lb/ton)**. A review of the NOx emission rate summary indicates that the applicant's proposal is not representative of the most stringent BACT determinations made to-date for plants utilizing dry processes.

The dry process with preheater/precalciner is considered to be the most energy-efficient process. Dry process preheater designs, such as the one to be employed by FCS, are also energy efficient. Therefore one would expect the lower fuel use to result in relatively low NO_X, all else being equal.

A survey of stack test data from various kilns around the country, operating for more than three years, suggests that a lower emission level than the one proposed for NOx is possible. Additionally, the Department became aware of a recent BACT determination in Nevada which was based on application of SNCR. These factors will also be considered in determining what emission rate can be achieved in accordance with a top-down BACT determination.

Sulfur dioxide

Sulfur dioxide (SO_2) may be generated both from sulfur compounds such as sulfates in the raw materials and from sulfur in the fuel. The sulfur content of both raw materials and fuels varies from plant to plant and with geographic location. Sulfur dioxide at this facility will be generated by the combustion of coal and tires in the kiln and generation of sulfur gases from the raw materials.

The exhaust gas from a cement kiln can contain varying amounts of SO_2. Under low oxygen conditions, sulfates in the raw materials can be converted to SO_2. At high temperature and excess air conditions, some of the sulfur introduced into the cement kiln with the raw materials, and most of the sulfur contained in the fuel, are converted to SO_2. Most of the SO_2 subsequently reacts with oxygen and alkali compounds (such as Na_2O and K_2O vaporized at sintering temperatures) to form alkali sulfates, which are found in cement clinker and in kiln dust. The amount of SO_2 released in the kiln flue gases will vary with the amount of excess alkali available for absorption. Additional SO_2 may be removed through contact with the incoming raw materials and, to some extent, in the particulate control equipment.

SO_2 control processes can be classified into five categories: fuel/material sulfur content limitations, absorption by a solution, adsorption on a solid bed, direct conversion to sulfur, or direct conversion to sulfuric acid.

FCS proposes to limit SO_2 emissions by taking advantage of the alkaline environment in the kiln, preheater, and raw mill to effect substantial removal of SO_2. Ultimately the sulfur is incorporated into the clinker lattice structure, thus minimizing the amount emitted to the atmosphere. Some additional SO_2 removal through contact with particulate matter may also take place in the kiln/cooler baghouse.

The SO_2 limit proposed by the applicant (0.55 lbs/ton clinker) is less stringent than some BACT determinations for other portland cement plants.

A review of the BACT determinations for cement plants as contained in the BACT Clearinghouse indicates SO_2 reduction levels from 70 to 96% (percent) from facilities utilizing the dry processes. The Department did not find instances of BACT involving measures beyond those proposed by FCS. Some plants use baghouses as proposed by FCS instead of Electrostatic Precipitators (ESPs) for particulate control. It is possible that the filter cake on the bags enhances SO_2 removal compared with an ESP. However the difference is marginal compared with the primary removal mechanism involving oxidation of SO_2 to SO_3, alkali reactions, and subsequent removal of sulfates as particulate matter and with the clinker.

A survey of stack test data from different facilities around the country operating for at least three years demonstrates lower rates possible for SO_2. This factor along with the energy efficiency of the plant, and the possible benefits of removal by the particulate control system will be considered by the Department in making a top-down BACT determination.

COMBUSTION PRODUCTS

Particulate Matter (PM, PM10) and Beryllium

Particulate Matter is generated by the various physical and chemical processes at a cement manufacturing plant. Sources of particulate matter at cement plants include (1) quarrying and crushing, (2) raw material storage, (3) grinding and blending, 4) clinker production, 5) finish grinding, and 6) packaging and loading. Additional sources of PM are raw material storage piles, conveyers, storage silos, and unloading facilities. The largest emission source of PM within cement plants is the pyroprocessing system that includes the kiln and clinker cooler exhaust stacks (in this case, common kiln/cooler stack). Emissions from kilns are affected by several factors, including differences in convective patterns, material movement patterns, burner locations and insertion lengths, heat transfer mechanisms, and the type of clinker cooler that supplies secondary air to the kiln for combustion. Typically, dust from the pollution control equipment servicing the kiln and cooler is collected and recycled into the kiln and thus incorporated into the clinker. FCS has not stated that all cement kiln dust (CKD) captured in the baghouse will be returned to the pyroprocessing system as raw material. It is expected that the majority of it will be recycled, while any excess will be stored in a silo for sale.

Common control devices for stack gases include settling chambers, inertial separators, impingement separators, wet scrubbers, fabric filters, and electrostatic precipitators. Fabric filters (baghouses) and electrostatic precipitator (ESPs) are generally considered equivalent for particulate control. Both types of devices can achieve removal efficiencies of over 99%. ESPs and baghouses are used extensively as control devices at cement plants. ESPs are generally specified for kiln and clinker cooler exhaust gases because of their ability to operate effectively at varying temperatures. Baghouses are also used at various facilities for particulate control from kilns and coolers. Both types of control equipment provide for the recovery/recycling of collected dust back into the process stream. Baghouses are also used to control particulate emissions from most other material processing operations at cement plants.

Common controls to limit particulate emissions from fugitive sources (such as roadways, stockpiles, and material processing and conveying equipment) include wet suppression, sweeping, application of surfactants, paving of roads and covering of stockpiles to reduce wind erosion. Wet suppression of fugitive particulate emissions is considered as BACT for most material handling operations and unpaved roads. Dust from stockpiles can be minimized by relatively high material moisture content with additional water spraying as necessary.

Small quantities of beryllium (Be) are generated by the combustion of coal and fuel oil blends. Beryllium will be generated as a particulate emission from the combustion of fuels, and will be controlled by the kiln/cooler baghouse. The applicant projects low emissions of Be such that it will not be subject to BACT.

A review of the BACT Clearinghouse shows that baghouses and ESPs are widely used to control particulate matter from process emission units at cement plants. They are commonly accepted as BACT.

The applicant has proposed the New Source Performance Standard NSPS limits of 0.3 pounds per ton of dry feed (kiln) and 0.1 pounds per ton of dry feed (cooler) as BACT for this facility. The NSPS values constitute the "floor" for BACT determinations. Consideration will also be given to any more stringent emission rates determined for kilns in Florida.

PRODUCTS OF INCOMPLETE COMBUSTION

Carbon Monoxide and Volatile Organic Compounds

Carbon monoxide (CO) is a pollutant formed by the incomplete combustion (oxidation) of carbon containing compounds in the cement kiln fuel and during the transformation of cement raw materials to cement clinker. When insufficient oxygen is provided, more CO and less CO_2 are formed than under excess air conditions. Substantial quantities of CO and CO_2 are also generated through calcining of limestone and other calcareous material. This calcining process thermally decomposes $CaCO_3$ to CaO and CO_2. The calcining of limestone in the cement manufacturing process liberates large amounts of CO_2, which is available for dissociation into CO.

VOC is also a pollutant formed by the incomplete combustion of fuel or hydrocarbons contained in the raw materials.

Emissions of CO can potentially be reduced at portland cement plants by two main methods: utilization of proper combustion practices to maximize the oxidation of CO to CO_2 and reducing the quantity of CO in the flu gas stream (flue gas control).

Emissions of VOC can be controlled by add-on control devices by the mechanisms of adsorption, absorption, or incineration (afterburning). Incineration processes include flame incineration, thermal incineration, and catalytic incineration. No add-on controls for CO or VOC have been demonstrated for cement plants.

The high temperatures and control of excess air and fuel, typically results in simultaneous optimization for control of products of incomplete combustion and NO_X. The applicant proposes

proper combustion practices as BACT to control emissions of CO from this plant. The applicant estimates low emissions of VOC such that the new kiln will not be subject to BACT for this pollutant.

A review of the BACT Clearinghouse reveals that for CO and VOC, BACT from cement plants for these pollutants is proper combustion practices.

BACT Determination by DEP:

Based on the information provided by the applicant and the information searches conducted by the Department, lower emissions limits can be obtained employing the top-down BACT approach for SO_2 and NO_X.

The Department has determined that the NO_X and SO_2 levels proposed by the applicant are roughly equal to typical emission limits from plants already in operation throughout the country and do not reflect previous BACT determinations for portland cement plants.

The Department reviewed Document EPA-453/R-94-004, "Alternative Control Techniques - NO_X Emissions from Cement Manufacturing." Various methods beyond the one proposed by the applicant are detailed. As previously mentioned, the high energy efficiency of the dry preheater process also suggests a lower NO_X limit is achievable. Based on the referenced document, it appears that SNCR, Low NO_X burners and Indirect Firing are available (at least as technology transfer) to consider in achieving a lower NO_X emission limit.

The Department also reviewed a paper presented at the Air and Waste Management Association (AWMA) International Specialty Conference on Waste Combustion in Boilers and Industrial Furnaces. The paper, "Reduction of NO_X Emissions from Cement Kiln/Calciner through the Use of the NO_XOUT Process," which was written by representatives of Nalco and Ash Grove Cement, suggests that SNCR is a viable control method. A level as low as 1.0 lb/ton of clinker was reached based on demonstration tests conducted at the Ash Grove cement plant in Seattle, Washington.

Recently a proposed cement plant (Great Star Cement, Clark County, Nevada) was permitted with the urea-based SNCR/NO_XOUT process as BACT. The process relies on the reaction between ammonia and NO_X to yield molecular nitrogen. The delivery system consists of urea injectors in one of the preheater sections. The objective was to achieve 50% reduction of NO_X emissions. At that level there should be no ammonia slip while meeting the BACT limit of 3.1 lb/ton clinker.

The Department recently issued a **(preliminary)** BACT determination to Florida Rock Industries (FRI) with a NO_X limit of 2.5 lb/ton clinker **(subsequently revised to 2.8 lb/ton)**. FRI had proposed a BACT limit of 4.6 lbs/ton. The Department is requiring FRI to examine additional control options, such as SNCR to insure the limit is achieved.

Based on a recent Nalco estimate prepared for Great Star Cement, the capital costs for SNCR on a 3100 TPD kiln is $471,000 ($54,165 on an annualized basis). Operating costs to reduce NO_X emissions by 3.0 lb/ton clinker are $674,000. First year costs are projected to be $728,000 and $410/ton NO_X removed.

The Department examined the worst case scenario which assumes that FCS can only achieve its proposed BACT NO_X value of 4.3 lb/ton clinker while employing proper combustion practices. The Department reviewed the degree to which SNCR can be employed in order to achieve a further (roughly 40%) NO_X reduction to 2.5 lb/ton clinker.

For the FCS plant, the purchase and installation of an SNCR system similar to the one proposed for Great Star Cement (but with a lower removal objective) would be approximately $575,000 for an annualized capital investment of approximately $65,000 per year. Annual operating costs would be approximately $200,000. First year costs would be approximately $265,000 or approximately $425 per additional ton of NO_X removed.

The cost per ton of NO_X removed is well within BACT costs for industry in general. The added cost to clinker production is low (approximately $0.40 per ton of clinker) relative to other factors such as raw materials, product, and transportation cost fluctuations.

The Department is also aware of a cement plant owned by Mitsubishi in California, which makes use of a similar principal by injecting municipal wastewater sludge into a preheater section and relying (to some extent) on released ammonia to help lower NO_X emissions.

FCS previously ruled out SNCR as infeasible because the "optimum temperature range to drive the SNCR reactions between 1600-2000 degrees F is encountered in a typical kiln system only in the kiln itself." FCS contends that injection of ammonia/urea in the kiln will cause increases in NO_X.

Although SNCR has been demonstrated in the U.S. on a preheater/precalciner kiln and is being required at another one, the previously-mentioned EPA cement plant NO_X document refers to an

SNCR demonstration in Europe on a preheater type kiln. It is possible that the applicant considered the temperature of the materials entering the kiln rather than the gases leaving the kiln.

Subsequent to issuance of the Preliminary BACT Determination, the Department was unable to verify actual application of SNCR at any preheater type kiln including the one mentioned in Europe. The kiln manufacturer, Polysius, was not willing to provide a NO_x limit guarantee of less than 4 lb/ton nor willing to guarantee the performance of product quality from the kiln with an SNCR system attached.

The Department agrees that SNCR has not been demonstrated on a preheater type cement kiln. However the Department rejects the claim by Polysius that the kiln cannot meet a NO_x emission limit less than 4 lb/ton.

For SO_2 the Department reviewed information in the BACT Clearinghouse, performance test results, and various cement technology documents detailing the chemical reactions and technological problems of making cement. It is the conclusion of the Department that the key factors in SO_2 removal is maintaining proper ratios of sulfur and alkali in the kiln environment and intimate contact between raw materials and exhaust gases. This is considered by the Department to be BACT. It is clear that FCS can insure low SO_2 emissions is through its preheater dry process.

The Department believes that lower values than proposed by the applicant with no add-on gas treatment, are possible. This is substantiated by the letter of October 28, 1983 from Sholtes and Koogler, Environmental Consultants, regarding the original kiln at FCS (which is identical to the one proposed). Per page 13, "Polysius (cement plant designer) states that if only sulfur dioxide from the cement plant were considered, sulfur dioxide emissions as low as 20 pounds per hour could be expected from the cement plant." This is further proved by actual emissions tests from the original kiln which average about 10 lbs of SO_2 per hour or approximately 0.1 lbs/ton clinker.

The Department has also concluded that sulfuric acid mist emissions are not expected to be significant because free sulfite (SO_3) will preferentially react with clinker and kiln dust in the alkali environment of the kiln. Also, little water is available to complete the reaction to acid mist.

The BACT emission levels are established by the Department as follows:

Source	Pollutant Emission Limit
Kiln (PM)	0.20 lbs/ton kiln feed (dry basis) and 0.31 lbs/ton clinker - 1 hour average
Kiln (PM_{10})	0.26 lbs/ton clinker - 1 hour average
Kiln (VE)	Visible emissions not to exceed 10 percent opacity
Kiln (SO_2)	0.27 lbs/ton clinker 24 hr rolling average Coal, blend of fuel oil and on-spec used oil (1.5 sulfur by weight), tires (up to 15% of heat input), and natural gas are the only fuels allowed
Kiln (NOx)	2.8 lbs/ton clinker - 24 hr rolling average
Kiln (CO)	2.0 lbs/ton clinker - 1 hr average
Kiln (SO_3)	0.014 lbs/ton clinker (non-BACT)
Kiln (VOC)	0.10 lbs/ton clinker (non-BACT)
Kiln (Be)	9.9×10^{-7} lbs/ton clinker (non-BACT)
Kiln (Hg)	2.4×10^{-5} lbs/ton clinker (non-BACT)
Kiln (Pb)	5.2×10^{-4} lbs/ton clinker (non-BACT)
Cooler (PM)	0.10 lbs/ton kiln feed (dry basis) and 0.16 lbs/ton clinker
Cooler (PM10)	0.13 lbs/ton clinker
Cooler (VE)	Visible emissions not to exceed 10% opacity
Minor points with baghouses	Visible emissions not to exceed 5% opacity
Fugitive sources	Visible emissions not to exceed 10% opacity

Compliance with the particulate emission limitations shall be in accordance with the EPA Reference Method 5 as contained in Appendix A, 40 CFR 60, and set forth in Subsection 60.64 of the NSPS for Portland Cement Plants, 40 CFR 60.

Compliance with opacity standards shall be determined by conducting observations in accordance with 40 CFR 60, Appendix A, Method 9.

Compliance with the SO_2 and NO_x emission limitations shall be demonstrated using CEMS.

Compliance with the CO limitations shall be demonstrated by 3 one-hour tests using EPA Method 10.

Pursuant to F.A.C. 62-4.070(3), 62-212.400(5)(c) and 62-296.330, the kiln/cooler exhaust system shall be equipped with continuous monitors to record NO_x and SO_2 for the purposes of compliance; opacity at the stack to indicate proper maintenance and operation; and CO and/or O_2 to optimize combustion conditions for pollution control.

Compliance with the VOC limitations shall be demonstrated (on a one time basis) by three one hour stack tests using Method 25 or 25A to confirm emission rate is less than the PSD significant emission rate.

Compliance with the Pb, Hg, and Be limitations shall be demonstrated (on a one time basis) by three one-hour stack tests using EPA Method 29 to confirm emission rate is less than the PSD significant emission rate.

BACT Determination Rationale:

BACT for visible emissions was determined to be more stringent than the NSPS for Portland Cement Plant, 40 CFR 60, Subpart F. With respect to the kiln, BACT for PM was determined to be more stringent than the NSPS for Portland Cement Plant, 40 CFR 60, Subpart F. The basis is the BACT Determination set by EPA for Pennsuco Cement, Medley, Florida in 1980.

BACT for SO_2 emissions from the cement kiln was based on the lowest number (0.28 lbs/ton clinker) given in the BACT Clearinghouse database. A slightly lower value of 0.27 lbs/ton clinker will also insure that ambient SO_2 concentration increases will be less than applicable National Park Service Significant Impact Level. Although it appears that FCS can achieve even lower values, it would be prudent to allow sufficient flexibility such that emissions of all combustion products can be minimized simultaneously.

For each small baghouse in the material handling process the exhaust gases must not exhibit greater than 5 percent opacity. The Department has determined that 5 percent opacity is BACT, and is attainable with a baghouse.

BACT for NO_x emissions from the cement kiln was determined to be equal to 2.8 lbs/tons of clinker. **This rate is lower than that of any preheater type kiln and is based on the Department's assessment of the capability of such a kiln without SNCR, notwithstanding assertions to the contrary by the manufacturer's representative.**

BACT for CO was determined to be 2.0 lbs/ton clinker. This value is greater than the proposed by FCS or given in AP-42. It will provide additional flexibility to minimize NO_x and SO_2 emissions.

No BACT determination was required for VOC. The Department set a limit higher than requested by FCS which will result in annual emissions less than the BACT threshold, but allow FCS a little more flexibility in optimizing all control for all combustion products.

No BACT determination was required for Pb. The limit requested by FCS was adopted insures BACT will not be triggered.

No BACT was required for Be. The limit requested by FCS was not adopted because it would trigger BACT. The adopted value willresult in emissions less than the PSD significant threshold value.

Nc BACT was required for Hg. The estimate provided by FCS will result in emissions less than the applicable BACT threshold.

Details of the Analysis May be Obtained by Contacting:

Teresa Heron, Review Engineer,
A. A. Linero, Administrator, New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

A A Linero P.E. for

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

Date: 11/17/95

Approved By:

Howard L Rhodes

Howard L. Rhodes, Director
Division of Air Resources Mgmt.

Date: 11/17/95

Florida Department of
Environmental Protection

Memorandum

TO: Howard L. Rhodes

THRU: Clair Fancy

FROM: A. A. Linero

SUBJ: Approval of Construction Permit PSD-Fl-227 and AC 27-274892
Florida Crushed Stone Company (FCSC)

DATE: November 9, 1995

Attached for your approval and signature is a permit prepared by the Bureau of Air Regulation for the above mentioned company to construct a second 83 ton per hour cement plant. The project includes a dry process kiln with a preheater, clinker cooler, crushers, raw mill, finish mill, material and fuel handling equipment, silos, and shipping facilities.

Pollution control equipment include a common fabric filter system (baghouse) for particulate emissions from the kiln and cooler; absorption of sulfur compounds and metals into the product; combustion controls for volatile organic compounds (VOC) and carbon monoxide (CO); combustion control for nitrogen oxides (NOx); and baghouses for particulate emissions from other process emission units. A BACT determination was required for SO2, NOx, PM, and CO.

The original intent to issue was published in the Tampa Tribune on October 6, 1995. Some modifications were made in response to comments by FCSC, in particular, a change in the NOx emission limit from 2.5 to 2.8 pounds per ton of clinker.

Initially, the National Park Service determined that the project would have an adverse impact on visibility at the Chassahowitzka Class I area based on the NOx BACT limit of 4.3 pounds per ton of clinker proposed by the applicant. They advised us that the lower values we proposed were acceptable.

I recommend your approval and signature.

CHF/th/t