CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC

BROOKSVILLE SOUTH CEMENT PLANT

FACILITY ID: 0530021

Kiln No. 2 (EU 044)

AIR CONSTRUCTION PERMIT APPLICATION

SHORT-TERM TRIAL TESTING OF SPECIFIC ALTERNATIVE MATERIALS

SUBMITTED January 13, 2011

307-10-17

KOOGLER & ASSOCIATES, INC.
ENVIRONMENTAL SERVICES
4014 NW 13th STREET
GAINESVILLE, FL 32609-1923
352/377-5822 ▪ FAX/377-7158

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KA 307-10-17
January 13, 2011

Mr. Jeff Koerner
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
2600 Blair Stone Road, MS 5500
Tallahassee, Florida 32399-2400

RE: ***AC Permit Application: Short Term Trial Test of Specific Alternative Materials***
CEMEX Construction Materials, LLC
Brooksville South Cement Plant; Facility ID: 0530021
File: 0530021-031-AC

Dear Mr. Koerner:

Enclosed please find four (4) copies of an application for short term trial testing of specific alternative materials at the CEMEX Construction Materials, LLC, Brooksville South Cement Plant. These recovered materials are requested similar to other recent applications for materials that can supplant conventional fossil fuel and raw materials. These materials, while new to the experience of the cement plants in Florida, are used in other cement kilns throughout the U.S. and the world. CEMEX is proud to be a leader in innovative and environmentally progressive techniques to bring forth and establish the value to reduce, re-use, and recycle recovered materials from conventional wastes. We look forward to working with you to move this proposed project to a reality.

Please feel free to contact me at (352) 377-5822 or kulmer@kooglerassociates.com or Max Lee, at mlee@kooglerassociates.com if you have any questions regarding this submittal. I sincerely appreciate your time and consideration for this innovative project.

Regards,

Kyle G. Ulmer, E.I.
KOOGLER AND ASSOCIATES, INC.

cc: George Townsend, CEMEX

Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

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JAN 14 2011
BUREAU OF AIR REGULATION

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **CEMEX Construction Materials Florida, LLC**	
2. Site Name: **Brooksville South Cement and Power Plant**	
3. Facility Identification Number: **0530021**	
4. Facility Location... Street Address or Other Locator: **10311 Cement Plant Road** City: **Brooksville** County: **Hernando** Zip Code: **34601**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Maxwell R. Lee, Ph. D, P. E.**
2. Application Contact Mailing Address... Organization/Firm: **Koogler and Associates, Inc.** Street Address: **4014 NW 13th Street** City: **Gainesville** State: **Florida** Zip Code: **32609**
3. Application Contact Telephone Numbers... Telephone: **(352) 377- 5822** ext. **13** Fax: **(352) 377-7158**
4. Application Contact E-mail Address: **mlee@kooglerassociates.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 1/14/11	3. PSD Number (if applicable):
2. Project Number(s): 0530021-031-AC	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being submitted to obtain: (Check one)

Air Construction Permit

[X] Air construction permit.

[ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

[ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

[ ] Initial Title V air operation permit.

[ ] Title V air operation permit revision.

[ ] Title V air operation permit renewal.

[ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

[ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

[ ] Air construction permit and Title V permit revision, incorporating the proposed project.

[ ] Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

[ ] I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

Application is for short-term feasibility studies of alternate fuel materials for transport on-site, storage, and injection into the kiln system. The specific materials and the project description are detailed in Appendix 1.

No on-site processing of materials is requested.

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
044	Kiln No. 2/Preheater/Precalciner/Clinker Cooler	NA	NA

Application Processing Fee

Check one: ☐ Attached - Amount: $_____ ☒ Not Applicable

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   Jim Daniel, Cement Plant Manager
2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **CEMEX Construction Materials Florida, LLC**
   Street Address: **10311 Cement Plant Road**
   City: **Brooksville** State: **Florida** Zip Code: **34601**
3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(352) 799-7881** ext. Fax: **(352) 540-4794**
4. Owner/Authorized Representative E-mail Address: **jdaniel@cemexusa.com**
5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.

   Signature Date 1/12/11

Application Responsible Official Certification

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):

- [X] For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.
- [ ] For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
- [ ] For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
- [ ] The designated representative at an Acid Rain source or CAIR source.

3. Application Responsible Official Mailing Address...
Organization/Firm: **CEMEX Construction Materials Florida, LLC**
Street Address: **10311 Cement Plant Road**
City: **Brooksville** State: **Florida** Zip Code: **34601**

4. Application Responsible Official Telephone Numbers...
Telephone: **(352)799-7881** ext. Fax: **(352) 540 -4794**

5. Application Responsible Official E-mail Address: **jdaniel@cemexusa.com**

6. Application Responsible Official Certification:

I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

_____ _____

Signature Date

Professional Engineer Certification

1. Professional Engineer Name: **Maxwell R. Lee, Ph. D, P. E.**
   Registration Number: **58091**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Koogler & Associates**
   Street Address: **4014 NW 13th Street**
   City: **Gainesville** State: **FL** Zip Code: **32609**
3. Professional Engineer Telephone Numbers...
   Telephone: **(352) 377 - 5822** ext. **13** Fax: **(352) 377-7158**
4. Professional Engineer E-mail Address: **mlee@kooglerassociates.com**
5. Professional Engineer Statement:

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

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

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

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

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

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

Signature Date: 1/12/11

(seal)

* Attach any exception to certification statement.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone **17** East (km) **360.0** North (km) **3162.5**		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **32**	6. Facility SIC(s): **3241**
7. Facility Comment :			

Facility Contact

1. Facility Contact Name: **George Townsend, Environmental Manager**
2. Facility Contact Mailing Address... Organization/Firm: **CEMEX Construction Materials Florida, LLC** Street Address: **10311 Cement Plant Road** City: **Brooksville** State: **Florida** Zip Code: **34601**
3. Facility Contact Telephone Numbers: Telephone: **(325) 799-7881** ext. Fax: **(352) 799-6088**
4. Facility Contact E-mail Address: **gtownsend@cemexusa.com**

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official E-mail Address:

FACILITY INFORMATION

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	

The Cement Plant is subject to;
40 CFR 60 Subpart F: Standards of Performance for Portland Cement Plants (superceded by 40 CFR 63, Subpart LLL);
40 CFR 60, Subpart Y: Standards of Performance for Coal Preparation Plants; and
40 CFR 63 Subpart LLL: National Emission Standards for Hazardous Air Pollutants from the Portland Cement Industry.

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
PM	**A**	**N**
PM_{10}	**A**	**N**
SO_2	**A**	**N**
NO_x	**A**	**N**
CO	**A**	**N**
HAPs	**A**	**N**
D/F	**B**	**N**
H114	**B**	**N**
SAM	**B**	**N**
FL	**B**	**N**

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:_____ ☒ Previously Submitted, Date: **Nov. 2010**
2.	Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:_____ ☒ Previously Submitted, Date: **Nov. 2010**
3.	Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:_____ ☒ Previously Submitted, Date: **Nov. 2010**

Additional Requirements for Air Construction Permit Applications

1.	Area Map Showing Facility Location: ☐ Attached, Document ID:_____ ☒ Not Applicable (existing permitted facility)
2.	Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): ☒ Attached, Document ID: **1**
3.	Rule Applicability Analysis: ☒ Attached, Document ID: **1**
4.	List of Exempt Emissions Units: ☐ Attached, Document ID:_____ ☒ Not Applicable (no exempt units at facility)
5.	Fugitive Emissions Identification: ☒ Attached, Document ID: **1** ☐ Not Applicable
6.	Air Quality Analysis (Rule 62-212.400(7), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
7.	Source Impact Analysis (Rule 62-212.400(5), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
8.	Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
9.	Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
10.	Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications - NA

1. List of Exempt Emissions Units:
   ☐ Attached, Document ID:_____ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications - NA

1. List of Insignificant Activities: (Required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application)

2. Identification of Applicable Requirements: (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought)
   ☐ Attached, Document ID:_____
   ☐ Not Applicable (revision application with no change in applicable requirements)

3. Compliance Report and Plan: (Required for all initial/revision/renewal applications)
   ☐ Attached, Document ID:_____
   Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.

4. List of Equipment/Activities Regulated under Title VI: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____
   ☐ Equipment/Activities Onsite but Not Required to be Individually Listed
   ☐ Not Applicable

5. Verification of Risk Management Plan Submission to EPA: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable

6. Requested Changes to Current Title V Air Operation Permit:
   ☐ Attached, Document ID:_____ ☐ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1. Acid Rain Program Forms:

   Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable (not an Acid Rain source)

   Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable

   New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable

2. CAIR Part (DEP Form No. 62-210.900(1)(b)):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable (not a CAIR source)

Additional Requirements Comment

The Power Plant Boiler (EU 018) ONLY, is subject to CAIR. EU 018 is separately owned (Arroyo Energy) and operated (Central Power & Lime) from Cemex.

EMISSIONS UNIT INFORMATION
Section [1] of [1]

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [1] of [1]

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

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

Emissions Unit Description and Status

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

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

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

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

2. Description of Emissions Unit Addressed in this Section:
Kiln No.2/Preheater/Precalciner/Clinker Cooler/Raw Mill

3. Emissions Unit Identification Number: **044**

4. Emissions Unit Status Code: **A**	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

EMISSIONS UNIT INFORMATION
Section [1] of [1]

Emissions Unit Control Equipment/Method: Control **1** of **3**

1. Control Equipment/Method Description: **Baghouse – High Temperature**
2. Control Device or Method Code: **016**

Emissions Unit Control Equipment/Method: Control **2** of **3**

1. Control Equipment/Method Description: **Selective Noncatalytic Reduction (SNCR)**
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control **2** of **3**

1. Control Equipment/Method Description: **Staged Combustion**
2. Control Device or Method Code: 025

EMISSIONS UNIT INFORMATION
Section [1] of [1]

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **206.3 TPH (1-hr); 4,620 TPD; 1,686,300 TPY dry preheater feed & flyash rate**	
2. Maximum Production Rate: **125 TPH (1-hr); 2,800 TPD; 1,022,000 tons/consecutive 12-mo. clinker**	
3. Maximum Heat Input Rate: **390** million Btu/hr **(pyroprocessing system)**	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	
24 hours/day	**7** days/week
52 weeks/year	**8,760** hours/year
6. Operating Capacity/Schedule Comment:	

EMISSIONS UNIT INFORMATION
Section [1] of [1]

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **Kiln 2**	2. Emission Point Type Code: **1**	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Equipment ID 331.BF300**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **318** feet	7. Exit Diameter: **10.1** feet
8. Exit Temperature: **270** °F	9. Actual Volumetric Flow Rate: **311,000** acfm	10. Water Vapor: **12.2** %
11. Maximum Dry Standard Flow Rate: **194,000** dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:		

EMISSIONS UNIT INFORMATION
Section [1] of [1]

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment **1** of **11**

1. Segment Description (Process/Fuel Type): **Industrial Processes; In-Process Fuel Use; Natural Gas; Cement Kiln/Dryer – Kiln and Precalciner**		
2. Source Classification Code (SCC): **3-90-006-02**	3. SCC Units: **Million Cubic Feet Burned**	
4. Maximum Hourly Rate: **0.432**	5. Maximum Annual Rate: **3,784.3**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **Negligible**	8. Maximum % Ash: **Negligible**	9. Million Btu per SCC Unit: **1,050**
10. Segment Comment: **The annual rate is based on the hourly rate and 8,760 hr/yr.**		

Segment Description and Rate: Segment **2** of **11**

1. Segment Description (Process/Fuel Type): **Industrial Processes; Mineral Products; Cement Manufacturing (Dry Process); Raw Material Grinding and Drying – Raw Mill**		
2. Source Classification Code (SCC): **3-05-006-13**	3. SCC Units: **Tons Processed (DRY BASIS)**	
4. Maximum Hourly Rate: **225 (dry)**	5. Maximum Annual Rate: **1,971,000 (dry)**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **The kiln shall not process more than 225 tons per hour of dry preheater feed and dry flyash and shall not exceed 5,400 tons in any 24-hr period (24-hr average). Process and production rates shall be further limited to 1,971,000 tons of dry preheater feed and dry flyash in any consecutive 12-mo period (5,400 tons/day).**		

EMISSIONS UNIT INFORMATION
Section [1] of [1]

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment 3 of 11

1. Segment Description (Process/Fuel Type): **Industrial Processes; Mineral Products; Cement Manufacturing (Dry Process); Preheater Kiln**		
2. Source Classification Code (SCC): **3-05-006-22**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **206.3**	5. Maximum Annual Rate: **1,686,300**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **The kiln shall not process more than 206.3 tons per hour of dry preheater feed and dry flyash and shall not exceed 4,620 tons in any 24-hr period (24-hr average). Process and production rates shall be further limited to 1,686,300 tons of dry preheater feed and dry flyash in any consecutive 12-mo period (4,620 tons/day) and 1,022,000 tons of clinker in any consecutive 12-mo period (2,800 tons/day).**		

Segment Description and Rate: Segment 4 of 11

1. Segment Description (Process/Fuel Type): **Industrial Processes; In-Process Fuel Use; Bituminous Coal; Cement Kiln Dryer (Bituminous Coal)**		
2. Source Classification Code (SCC): **3-90-002-01**	3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **20.0**	5. Maximum Annual Rate: **175,200**	6. Estimated Annual Activity Factor:
7. **Maximum** % Sulfur: **1.0**	8. **Maximum** % Ash: **10**	9. Million Btu per SCC Unit: **26**
10. Segment Comment: **Annual rate is based on the hourly rate and 8,760 hr/yr.**		

EMISSIONS UNIT INFORMATION
Section [1] of [1]

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment **5** of **11**

1. Segment Description (Process/Fuel Type): **Industrial Processes; In-Process Fuel Use; Distillate Oil; Cement Kiln/Dryer – No. 2 Fuel Oil**		
2. Source Classification Code (SCC): **3-90-005-02**	3. SCC Units: **Thousand Gallons Burned**	
4. Maximum Hourly Rate: **3.08**	5. Maximum Annual Rate: **26,980.8**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **1.5**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit:
10. Segment Comment: **No. 2 fuel oil is used primary for startup/preheating of the Cement Kiln.**		

Segment Description and Rate: Segment **6** of **11**

1. Segment Description (Process/Fuel Type): **Industrial Processes; In-Process Fuel Use; On-spec Oil; Cement Kiln/Dryer**		
2. Source Classification Code (SCC): **3-90-004-02**	3. SCC Units: **Thousand Gallons Burned**	
4. Maximum Hourly Rate: **3.08**	5. Maximum Annual Rate: **26,980.8**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **1.5**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **26**
10. Segment Comment: **Residual oil is used for startup/preheating of the Cement Kiln.**		

EMISSIONS UNIT INFORMATION
Section [1] of [1]

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment 7 of 11

1. Segment Description (Process/Fuel Type): **Industrial Processes; Mineral Products; Cement Manufacturing (Dry Process); Clinker Cooler**		
2. Source Classification Code (SCC): **3-05-006-14**	3. SCC Units: **Tons Processed**	
4. Maximum Hourly Rate: **125**	5. Maximum Annual Rate: **1,095,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **The Kiln shall not produce more than 125 tons of clinker per hour, and 2,800 tons in any 24-hr period (24-hr average). Process and production rates shall be further limited to 1,686,300 tons of dry preheater feed and dry flyash in any consecutive 12-mo period (4,620 tons/day) and 1,022,000 tons of clinker in any consecutive 12-mo period (2,800 tons/day).**		

Segment Description and Rate: Segment 8 of 11

1. Segment Description (Process/Fuel Type): **Industrial Processes; In-Process Fuel Use; Coke; General: Coke**		
2. Source Classification Code (SCC): **3-90-008-99**	3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **14.7**	5. Maximum Annual Rate: **128,436**	6. Estimated Annual Activity Factor:
7. **Typical** % Sulfur: **0.5-1.0**	8. **Typical** % Ash: **0.5-5.0**	9. Million Btu per SCC Unit: **26.6**
10. Segment Comment: **Heat value based on AP-42, Appendix A. Annually rate based on hourly rate and 8,760 hr/yr.**		

EMISSIONS UNIT INFORMATION
Section [1] of [1]

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment **9** of **11**

1. Segment Description (Process/Fuel Type): **Industrial Processes; In-Process Fuel Use; Solid Waste; Whole Tires (TDF)**		
2. Source Classification Code (SCC): **3-90-012-99**	3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **4.3**	5. Maximum Annual Rate: **37,668**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **28**
10. Segment Comment: **Annual rate based on hourly rate and 8,760 hr/yr.**		

Segment Description and Rate: Segment **10** of **11**

1. Segment Description (Process/Fuel Type): **Industrial Processes; In-Process Fuel Use; Liquified Petroleum Gas; Propane**		
2. Source Classification Code (SCC): **3-90-010-99**	3. SCC Units: **Thousand Gallons Burned**	
4. Maximum Hourly Rate: **4.3**	5. Maximum Annual Rate: **37,668**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **90.5**
10. Segment Comment: **Heat value based on AP-42, Appendix A. Annually rate based on hourly rate and 8,760 hr/yr.**		

EMISSIONS UNIT INFORMATION
Section [1] of [1]

D. SEGMENT (PROCESS/FUEL) INFORMATION (CONTINUED)

Segment Description and Rate: Segment 11 of 11 **UPDATED SEGMENT**

1. Segment Description (Process/Fuel Type): **Industrial Processes; In-Process Fuel Use; Alternative Materials**		
2. Source Classification Code (SCC): **3-90-012-99**	3. SCC Units: **Tons Burned**	
4. Maximum Hourly Rate: **See Appendix 1**	5. Maximum Annual Rate: **See Appendix 1**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **See Appendix 1**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **See Appendix 1.**
10. Segment Comment: **Segment represents temporary trial burn of limited quantity of non-hazardous fuels: See Appendix 1 for list of fuels and details.**		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM	**016**		**EL**
PM_{10}	**016**		**EL**
SO_2			**EL**
NO_x	**107/025**		**EL**
CO			**EL**
VOC			**EL**
H114 (Mercury)			**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **28.8** lb/hour **117.6** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.136 lb/ton of kiln feed, 0.23 lb/ton of clinker** Reference: **Permit No. 0530021-021-AV**	7. Emissions Method Code: **0**
8. Calculation of Emissions: **125 ton/hr x 0.23 lb/ton = 28.8 lb/hr** **1,022,000 ton/yr x 0.23 lb/ton = 235,060 lb/yr = 117.6 ton/yr**	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Note: The above emissions are based on coal combustion as permitted under the current permit. See Appendix 1 for the expected change of emissions due to the use of alternative materials/fuels.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.136 lb/ton of kiln feed**	4. Equivalent Allowable Emissions: **28.1** lb/hour **114.7** tons/year
5. Method of Compliance: **EPA Method 5**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0530021-021-AV and BACT. Applies to the preheater feed.**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **25.0** lb/hour **102.3** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.118 lb/ton of kiln feed, 0.20 lb/ton of clinker** Reference: **Permit No. 0530021-021-AV**	7. Emissions Method Code: **0**
8. Calculation of Emissions: **125 ton/hr x 0.20 lb/ton = 25.0 lb/hr** **1,022,000 ton/yr x 0.20 lb/ton = 204,400 lb/yr = 102.3 ton/yr**	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Note: The above emissions are based on coal combustion as permitted under the current permit. See Appendix 1 for the expected change of emissions due to the use of alternative materials/fuels.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.118 lb/ton of kiln feed**	4. Equivalent Allowable Emissions: **24.3** lb/hour **99.5** tons/year
5. Method of Compliance: **EPA Method 5**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0530021-021-AV and BACT. Applies to the preheater feed.**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **28.8** lb/hour **117.6** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.23 lb/ton of clinker** Reference: **Permit No. 0530021-021-AV**	7. Emissions Method Code: **0**
8. Calculation of Emissions: **125 ton/hr x 0.23 lb/ton = 28.8 lb/hr** **1,022,000 ton/yr x 0.23 lb/ton = 235,060 lb/yr = 117.6 ton/yr**	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Note: The above emissions are based on coal combustion as permitted under the current permit. See Appendix 1 for the expected change of emissions due to the use of alternative materials/fuels.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.23 lb/ton of clinker**	4. Equivalent Allowable Emissions: **28.8** lb/hour **117.6** tons/year
5. Method of Compliance: **EPA Method 6 or 6C, and SO_2 CEMS.**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0530021-021-AV and BACT.**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **243.75** lb/hour **996.7** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.95 lb/ton of clinker** Reference: **Permit No. 0530021-021-AV**	7. Emissions Method Code: **0**
8. Calculation of Emissions: **125 ton/hr x 1.95 lb/ton = 243.75 lb/hr** **1,022,000 ton/yr x 1.95 lb/ton = 1,992,900 lb/yr = 996.7 ton/yr**	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Note: The above emissions are based on coal combustion as permitted under the current permit. See Appendix 1 for the expected change of emissions due to the use of alternative materials/fuels.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **1.95 lb/ton of clinker**	4. Equivalent Allowable Emissions: **243.75** lb/hour **996.5** tons/year
5. Method of Compliance: **EPA Method 7 or 7E, and NO_x CEMS.**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0530021-021-AV and BACT. The annual emission rate of 996.5 ton/yr applies after 180 days.**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **450** lb/hour **1,840** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **3.6 lb/ton of clinker** Reference: **Permit No. 0530021-021-AV**	7. Emissions Method Code: **0**
8. Calculation of Emissions: **125 ton/hr x 3.6 lb/ton = 450 lb/hr** **1,022,000 ton/yr x 3.6 lb/ton = 3,679,200 lb/yr = 1,840 ton/yr**	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Note: The above emissions are based on coal combustion as permitted under the current permit. See Appendix 1 for the expected change of emissions due to the use of alternative materials/fuels.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **3.6 lb/ton of clinker**	4. Equivalent Allowable Emissions: **450** lb/hour **1,840** tons/year
5. Method of Compliance: **Method 10 or 10A, and CO CEMS.**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0530021-021-AV and BACT. The annual emission rate of 1,840 ton/yr includes 30-day average for first 180 days.**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **15.0** lb/hour **61.3** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.12 lb/ton of clinker** Reference: **Permit No. 0530021-021-AV**	7. Emissions Method Code: **0**
8. Calculation of Emissions: **125 ton/hr x 0.12 lb/ton = 15.0 lb/hr** **1,022,000 ton/yr x 0.12 lb/ton = 122,640 lb/yr = 61.3 ton/yr**	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Note: The above emissions are based on coal combustion as permitted under the current permit. See Appendix 1 for the expected change of emissions due to the use of alternative materials/fuels.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.12 lb/ton of clinker**	4. Equivalent Allowable Emissions: **15.0** lb/hour **61.3** tons/year
5. Method of Compliance: **Method 25 or 25A, and VOC CEMS**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0530021-021-AV and BACT.**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: **H114**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **0.061** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **41 µg/dscm** Reference: **NESHAP Subpart LLL**	7. Emissions Method Code: **0**
8. Calculation of Emissions:	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: **Annual limit of 122 lb/yr based on BACT**	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour **0.061** tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Subpart LLL. Per recent Subpart LLL revision, this existing kiln will be subject to limitations accordingly. The current limitations of Section 3(12) of Permit No. 0530021-021-AV are superseded by this revised NESHAP.**	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation **1** of **1**

1. Visible Emissions Subtype: **VE10**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **10** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Opacity CEMS**	
5. Visible Emissions Comment:	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor **1** of **8**

1. Parameter Code: **EM**	2. Pollutant(s): **CO**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **ABB** Model Number: **URAS 26**	Serial Number: **04731961/5007**
5. Installation Date: **4/25/2008**	6. Performance Specification Test Date: **3/19/2010**
7. Continuous Monitor Comment: **required by BACT**	

Continuous Monitoring System: Continuous Monitor **2** of **8**

1. Parameter Code: **EM**	2. Pollutant(s): **CO_2**
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: **ABB** Model Number: **URAS 26**	Serial Number: **0240326926/100**
5. Installation Date: **3/3/2010**	6. Performance Specification Test Date: **3/19/2010**
7. Continuous Monitor Comment: **required by GHG Rule, 40 CFR 98**	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor **3** of **8**

1. Parameter Code: **EM**	2. Pollutant(s): **NO, NO_2, SO_2**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **ABB** Model Number: **Limas 11 UV**	Serial Number: ***04731961/5001***
5. Installation Date: **4/25/2010**	6. Performance Specification Test Date: **3/19/2010**
7. Continuous Monitor Comment: **required by BACT**	

Continuous Monitoring System: Continuous Monitor **4** of **8**

1. Parameter Code: **EM**	2. Pollutant(s): **THC**
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: **ABB** Model Number: **Multi-FID 14**	Serial Number: **04731961/6010**
5. Installation Date: **4/25/2010**	6. Performance Specification Test Date: **3/19/2010**
7. Continuous Monitor Comment: **required by Subpart LLL**	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor **5** of **8**

1. Parameter Code: **FLOW**	2. Pollutant(s):
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: **Durag** Model Number: **D-FL 200 G**	Serial Number: **432176**
5. Installation Date: **4/25/2010**	6. Performance Specification Test Date: **3/19/2010**
7. Continuous Monitor Comment: **required by GHG Rule, 40 CFR 98 and BACT**	

Continuous Monitoring System: Continuous Monitor **6** of **8**

1. Parameter Code: **VE**	2. Pollutant(s): **Opacity**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **Durag** Model Number: **D-R 290**	Serial Number: **432024**
5. Installation Date: **4/25/2010**	6. Performance Specification Test Date: **3/19/2010**
7. Continuous Monitor Comment: **required by BACT**	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor **7** of **8**

1. Parameter Code: **EM**	2. Pollutant(s): **H_2O**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **NEO Monitors** Model Number: **Laser Gas II**	Serial Number: **10075**
5. Installation Date: **4/25/2010**	6. Performance Specification Test Date: **3/19/2010**
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor **8** of **8**

1. Parameter Code: **EM**	2. Pollutant(s): **O_2**
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: **ABB** Model Number: **URAS 26**	Serial Number: **04731961/5007**
5. Installation Date: **4/25/2008**	6. Performance Specification Test Date: **3/19/2010**
7. Continuous Monitor Comment: **required by LLL for oxygen correction**	

EMISSIONS UNIT INFORMATION
Section [1] of [1]

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: **1** [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: **1** [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [X] Previously Submitted, Date **Nov. 2010**

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date _____
   [x] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [X] Previously Submitted, Date **Nov. 2010**
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   [x] Previously Submitted, Date: **2010**
   Test Date(s)/Pollutant(s) Tested: **3/19 (VE, VOC), 4/28 (NO_x, SO_2, CO), 6/17 (PM), 6/13 (Hg)**
   [ ] To be Submitted, Date (if known): _____
   [ ] Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   [ ] Attached, Document ID: _____ [x] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☒ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications - NA

1. Identification of Applicable Requirements: ☐ Attached, Document ID: _____
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: _____ ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☐ Not Applicable

Additional Requirements Comment

Appendix 1

AIR CONSTRUCTION PERMIT APPLICATION:

SHORT-TERM TRIAL TESTING OF SPECIFIC ALTERNATIVE MATERIALS

CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC

BROOKSVILLE SOUTH CEMENT PLANT

FACILITY ID: 0530021

Kiln No. 2 (EU 044)

APPENDIX

CONTENTS

DESCRIPTION OF PROPOSED PROJECT

INTRODUCTION

CEMEX Construction Materials Florida, LLC (CEMEX) owns and operates a cement plant located in Brooksville, Florida, designated as Brooksville South. The cement plant consists of two dry-process kilns with preheater, precalciner, and clinker coolers capable of producing 688,900 tons per year (TPY) of clinker in Kiln No. 1 and 1,022,000 TPY clinker in Kiln No. 2. Cement Kiln No. 2 is the focus of this project. It is currently permitted to utilize coal, natural gas, petroleum coke, propane, No. 2 fuel oil, on-specification used oil, flyash, and whole tires as fuels (authorized by Permit No. 0530021-009-AC).

CEMEX is requesting a permitted 24-month period for a first-stage air construction permit to conduct feasibility studies of specific processed recovered materials as alternative fuels and raw materials for the kiln system. It should be stressed that this permit is requesting to only allow short-term trials of these materials in order to evaluate their effectiveness in the process. During these requested trials, no permit limit will be exceeded. As such, no requests for an increase in either production limits or other limitations are being made. Brooksville South shall operate under and at all times within the constraints specified by its existing operation permit. If the co-firing of any material results in emissions exceeding current permit limits, co-firing shall cease immediately. If a trial testing material is evaluated and determined to be feasible and acceptable by the Department of Environmental Protection (DEP), a new construction permit will be submitted to establish long-term testing limitations and to construct a more permanent system.

The following materials are requested to be allowed for short-term trial testing:

- Agricultural Film (a non-chlorinated plastic)
- Agricultural Waste/Biomass (i.e., bagasse, peanut hulls, rice hulls, corn husks, citrus peels, cotton gin byproducts, and animal bedding)
- Carpet-derived Fuel
- Clean Woody Biomass
- Manufacturer Reject Roofing Shingle
- Preconsumer Reject Paper
- Tire Derived Fuel including Tirefluff
- On-spec used oil (from off-site sources)

CEMEX proposes that any material that is approved for trial testing will be subjected to a maximum test period of 60 kiln-operation days and will be evaluated at varying rates of consumption. A proposed schedule of testing each material for three heat input loads of 10, 20, and 29.5 percent is included in Table 1. Each material test will require a minimum 7 days prior notification to the DEP and submittal of the anticipated testing schedule containing test start date and end date, list of material supplier(s) facility contact person, address and phone number, specific target material feed rates (e.g. 10, 20, and 29.5 percent heat input replacement), and initial material analysis. The initial material analysis will include at a minimum, ultimate and proximate analysis, as well as content analysis of RCRA 8 metals. Additional initial material analysis components will be completed at the request of the DEP. Any changes to the testing schedule shall be communicated in writing to the DEP's Southwest District Office within 24 hours of the change. Each material type will be tested individually at targeted heat input rates to the kiln (see Table 1). The proposed rate of coal substitution at less than 30% heat replacement is to assure that any anticipated changes in regulation regarding the definition of waste and waste incinerator rules shall not impact this project.

For these short-term trials, no material will be processed on-site.

Estimated emissions from each material are provided in the following material-specific sections.

CEMEX believes this project is beneficial to the operation of the facility, as well as to the State of Florida for the following reasons:

1. Promotion of a more diverse energy supply.
2. Increase in the availability and stability of energy sources through the use of locally generated, processed, and transported energy sources in comparison to coal (transported from the Appalachia mountains).
3. Reduction of greenhouse gas emissions by re-using and reducing landfilled material.
4. Increase in the demand for recovered materials, which encourages an increase in processing versus landfilling. This matches the goals of the State efforts to increase waste diversion for re-use or recycling: http://www.dep.state.fl.us/waste/recyclinggoal75/default.htm.
5. Promotion of related recycling business activities (i.e., employment) in the State.

While these materials may be considered recovered or byproduct by some, they have the capacity to deliver significant heating value. Efficient thermal combustion in a cement kiln can provide an alternative use for the material heat content, as well as supplying a component to the cement making process when noncombustible material (e.g., sand/silica) is introduced into the kiln. The use of alternative materials in cement production will eliminate a substantial amount of landfilled waste, as well as reduce environmental taxes associated with the cement industry through mining, transport, and the use of fossil s. Similarly, when this waste is oxidized as fuel in a combustion environment, greenhouse gas emissions are effectively reduced when compared to the landfill process, which generates methane as a byproduct of anaerobic decomposition. The greenhouse gas potential of methane is 21 times greater than that of the carbon dioxide produced during combustion. A significant recent study indicates the benefits of waste combustion compared to landfilling with gas reclamation[1]. CEMEX views its effort to promote the beneficial use of these recovered materials in cement production to be in concert with the guidance of the EPA[2] and European IPPC Bureau[3].

TABLE 1. PROPOSED SCHEDULE OF TRIAL TESTING

CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC – BROOKSVILLE SOUTH CEMENT PLANT

	Fuel/Material	Heat Values (wet basis) (Btu/lb)	Heat Values (wet basis) (mmBtu/ton)	Moisture (Percent)	References
	Coal	13,350	26.7	4.20%	Based on 2010 monthly analysis
1)	Agricultural Film	18,600	37.2	0.5%	(4), (5)
2) a.	Agricultural Waste (max)	8,000	16	10%	(6), (7), (8), (9), (10), (11), (12), (13)
2) b.	Agricultural Waste (min)	1,500	3	50%	
3)	Carpet-Derived Fuel	9,194	18.388	0.5%	(14)
4)	Clean Woody Biomass	5,200	10.4	40%	(15), (16)
5)	Manufacturer Reject Roofing Shingles	5,842	11.684	3.1%	Appendix 3, St. Marys material analysis
6)	Preconsumer Paper	6,500	13	16%	(17)
7)	Tire Derived Fuel	13,800	27.6	0.45%	(18), (19)
8)	On-spec Used Oil	19,036	38.07	--	

	Heat Input Replaced (Percent)	Heat Rate of Firing Total (mmBtu/hr)	Coal (mmBtu/hr)	Alt. Fuel (mmBtu/hr)
60 Day Comparative Coal-Only Firing	0%	390	390	0
Esimated 20 Day Trial Burn Period No. 1	10%	390	351	39
Esimated 20 Day Trial Burn Period No. 2	20%	390	312	78
Esimated 20 Day Trial Burn Period No. 3	29.5%	390	275	115

		Mass Rate of Firing: Coal (ton/hr)	Mass Rate of Firing: Coal (ton/period)	Mass Rate of Firing: Alternate Fuel (ton/hr)	Mass Rate of Firing: Alternate Fuel (ton/period)	Total Req'd Alt Fuel (tons)	Requested Alt Fuel (tons)
July 1, 2010	Coal Firing at max. permitted rate	14.6	21,033.7	0.0	0.0	0.0	0
	Agricultural Film, 20 days at 10%	13.1	6,310.1	1.0	503.2	--	--
	Agricultural Film, 20 days at 20%	8.4	4,025.8	2.1	1,006.5	--	--
	Agricultural Film, 20 days at 29.5%	7.4	3,547.7	3.1	1,484.5	2,994.2	3,000
	Agricultural Waste (max), 20 days at 10%	↓	↓	2.4	1,170.0	--	--
	Agricultural Waste (max), 20 days at 20%			4.9	2,340.0	--	--
	Agricultural Waste (max), 20 days at 29.5%			7.2	3,451.5	6,961.5	7,000
	Agricultural Waste (min), 20 days at 10%			13.0	6,240.0	--	--
	Agricultural Waste (min), 20 days at 20%			26.0	12,480.0	--	--
	Agricultural Waste (min), 20 days at 29.5%			38.4	18,408.0	37,128.0	20,000
	Carpet-Derived Fuel, 20 days at 10%			2.1	1,018.1	--	--
	Carpet-Derived Fuel, 20 days at 20%			4.2	2,036.1	--	--
	Carpet-Derived Fuel, 20 days at 29.5%			6.3	3,003.3	6,057.4	6,500
	Clean Woody Biomass, 20 days at 10%			3.8	1,800.0	--	--
	Clean Woody Biomass, 20 days at 20%			7.5	3,600.0	--	--
	Clean Woody Biomass, 20 days at 29.5%			11.1	5,310.0	10,710.0	10,000
	Reject Roofing Shingles, 20 days at 10%			3.3	1,602.2	--	--
	Reject Roofing Shingles, 20 days at 20%			6.7	3,204.4	--	--
	Reject Roofing Shingles, 20 days at 29.5%			9.8	4,726.5	9,533.0	10,000
	Pre-consumer Paper, 20 days at 10%			3.0	1,440.0	--	--
	Pre-consumer Paper, 20 days at 20%			6.0	2,880.0	--	--
	Pre-consumer Paper, 20 days at 29.5%			8.9	4,248.0	8,568.0	5,000
	TDF, 20 days at 10%			1.4	678.3	--	--
	TDF, 20 days at 20%			2.8	1,356.5	--	--
	TDF, 20 days at 29.5%			4.2	2,000.9	4,035.7	4,500
July 1, 2012	On-spec Fuel Oil*, 5 days at 10%			1.0	122.9	--	--
	On-spec Fuel Oil*, 5 days at 20%			2.0	245.9	--	--
	On-spec Fuel Oil*, 5 days at 29.5%			3.0	362.6	731.4	400
						Total:	59,400

Same for all test periods

MONITORING AND TESTING

Emissions monitoring for each material tested shall consist of the following monitoring and stack testing:

- NO_x – CEM Data
- SO_2 – CEM Data
- VOC (as THC) – CEM Data
- Opacity – CEM Data
- PM – EPA Method 5
- CO – CEM Data
- Hg – Materials Balance

A monitoring/testing protocol will be submitted for approval prior to emissions testing. Submittal of all stack test reports in a summary report of the trial period will be within 90 days of the completion of the trail testing.

SUMMARY REPORT INFORMATION

The following minimum records will be obtained for all tests:

- Recovered Material Analysis Results
- Emissions Monitoring Results
- Average Fuel Feed Rates (tons or gallons/hour)
- Average Kiln Feed Rates (tons/hour)
- Average Clinker Production (tons/hour)
- Total Recovered Materials Consumption (tons/hour)
- Baghouse Inlet Temperature

TRANSPORT, HANDLING, STORAGE, AND INJECTION

All materials will be transported to the facility by covered truck and stored in trailers or under cover on top of a paved or compacted clay surface. CEMEX expects to only store the material in trailers. If material is stored under cover, materials will be deposited in separate piles totaling no more the 5,000 tons and visibly marked. In order to determine the amount of each material required, typical heat contents were ascertained for each alternative fuel. Using this value, along with the permitted heat capacity and the time constraint of a 60 day trial period for coal substitution fraction (intervals of 10, 20, and 29.5 percent), the required tonnage was derived for each fuel source. This is reflected in Table 1 as a requested amount of material tonnage. The agricultural byproducts materials were reviewed and found to have a high variability in heat content per the various types of byproducts. Due to this inherent variability in heat content, a minimum and maximum range of heat contents were used to demonstrate the expected range of quantities that could be selected. A maximum tonnage of 25,000 tons was established for this source in order to ensure limitations of transported/stored/handled material. Tonnage limitations for other materials are specified in the table. No more than 5,000 tons of all recovered materials will be stored at any one time. For this test trial, the materials will be supplied to the facility in a manner suitable for pneumatic injection into the pyroprocessing system through a temporary feeding system at the base of the precalciner tower. The materials will be transported by front end loader from the storage area to a hopper which feeds the temporary injection system. Dust suppression will consist of water sprays. Any stored material having nuisance odors will be removed from the site. A review of solid waste rule requirements will be conducted and addressed for temporary storage. Emissions from on-site material transport, storage, and handling are provided in Table 2.

The feeder system shown in Figure 1 was used for the recent CEMEX Miami biomass trials (0250014-031-AC) and is expected to be used for these trials. The system is a compact and simple design as an alternative fuel feeding system capable of handling many kinds of fuels with varying densities and physical properties. This same system is to be used for many other alternative fuel trial burns. The system is composed of: two offloading ports, screw conveyors to move the biomass from the offloading ports to the feed metering system and a pneumatic blower to the injection porthole in the precalciner.

Covered trucks unload sized biomass into the offloading ports as shown in Figure 2. Figure 2 shows a truck offloading materials to one port and another port is shown to be empty. Having two ports allowed for near continual input of biomass that was sequentially offloaded from each truck.

Figure 3 shows the feeder screw conveyors system at the bottom of the offload ports that feed the biomass to the Schenck metering system that is located at the top of the angled conveyor, followed by a pneumatic blower which blows the biomass up to the injection porthole. Figure 4 shows the conveyor from the offloading ports to the metering system. Figure 5 shows the pneumatic blower system from the metering system. The porthole installed in the precalciner tower matches the pneumatic system sizing, which is 8-inch in diameter. Figure 6 is the schematic of the blower system with an optional enclosed hopper system attached to the feeder system. Figure 7 shows the proposed location where the feeder system will be located next to the Kiln2 precalciner.

FIGURE 1. SCHENK FEEDER SYSTEM OF THE BIOMASS AT THE MIAMI CEMENT PLANT

FIGURE 2. TWO OFFLOADING PORTS OF THE SCHENCK FEEDER SYSTEM

FIGURE 3. SCREW CONVEYOR IN BOTTOM OF OFFLOADING PORTS.

FIGURE 4. CONVEYORS COMING FROM OFFLOADING PORTS TO METERING SYSTEM.

FIGURE 5. PNEUMATIC BLOWER FROM METERING SYSTEM TO INJECTION PORTHOLE.

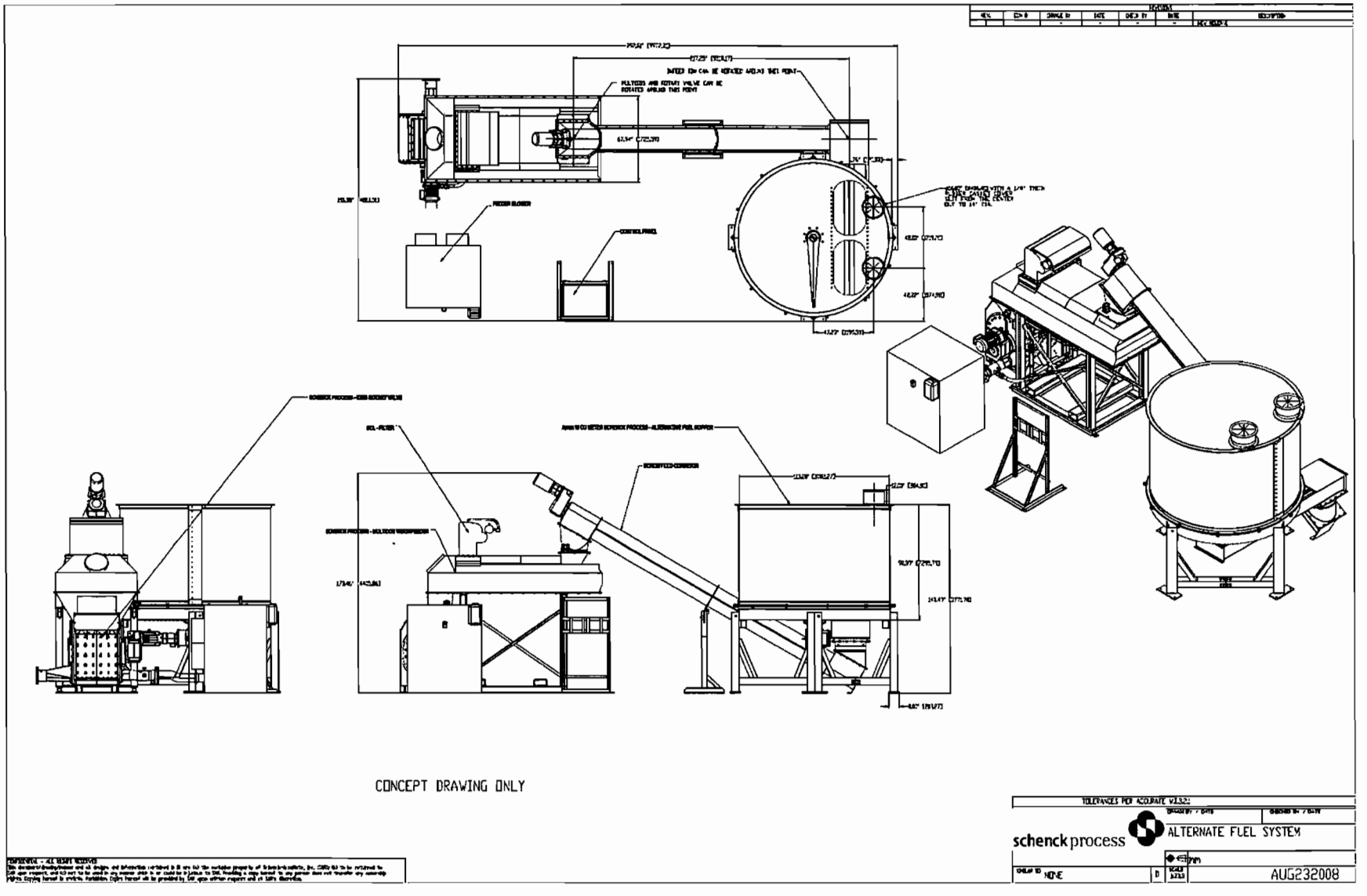


FIGURE 6. SCHENCK FEEDER SYSTEM WITH OPTIONAL ENCLOSED FEED HOPPER FOR "PIG" TANK OFFLOAD.

TABLE 2. FUGITIVE EMISSIONS ESTIMATE – TRANSPORT, STORAGE, AND HANDLING
CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC – BROOKSVILLE SOUTH CEMENT PLANT

Step	Action/Task	Unit of Measurement	% of Total Throughput	PM Emission Factor	PM/PM_{10} Emissions	$PM_{2.5}$ Emissions
1	Material Transport to Piles[a,b]	6,087 miles	100%	0.524 lb/VMT	1.59 tons	0.14 tons
2	Store in Covered Pile	100,000 tons	100%	*negligible, stored under cover*		
3	Material Transport to Injection System[a,b]	435 miles	100%	0.524 lb/VMT	0.11 tons	0.01 tons
4	Material Loaded into Pneumatic Hopper[b]	100,000 tons	100%	0.0001 lb/ton	0.005 tons	0.00 tons
5	Pneumatic Transport to Calciner	100,000 tons	100%	*negligible, fully enclosed*		
				Total:	1.71 tons	0.15 tons

Sample Calculations:

Step 1	$\frac{1.4\ miles}{trip^c} \times \frac{trip^c}{22\ tons} \times 100{,}000\ tons\ alt\ fuel = 6{,}087\ miles$
Step 3	$\frac{0.1\ miles}{trip} \times \frac{trip}{22\ tons} \times 100{,}000\ tons = 435\ miles$
a.	$E = \left[k\left(\frac{sL}{2}\right)^{0.65}\left(\frac{W}{3}\right)^{1.5} - C\right] x\left(1 - \frac{p}{4N}\right)$ *where from AP-42 and references, k=0.082, sL=0.4, W=22, C=0.00047, p=120, N=1* $E = \left[k\left(\frac{0.4}{2}\right)^{0.65}\left(\frac{22}{3}\right)^{1.5} - 0.00047\right] x\left(1 - \frac{120}{4}\right) = 0.524$

a. Potential PM emissions from truck traffic from paved roads are calculated based on AP- 42 factors in 13.2.1-1 and -2 and calculation a. above

b. Emission factors of screening, crushing, and conveying based on AP-42 Table 11.19.2-2. Alternate fuel PM factors assumed to have similar emissions to aggregate operation. Uncontrolled emission factors are used. PM2.5 based on SCC 3-05-020-06,
ratio PM2.5/PM = 0.000013/0.00014 =0.09

c. Trip: route from plant entrance to storage piles

FIGURE 7. LOCATION OF THE PROCESSING AREA NEXT TO THE KILN 2 PRECALCINER.

BEST MANAGEMENT PRACTICES

The following best management practices are proposed for the trial tests of recovered materials at the CEMEX Brooksville South Cement Plant.

BEST MANAGEMENT PRACTICES (BMP) PLAN FOR MINIMIZATION OF FUGITIVE DUST, PILE MANAGEMENT, AND FIRE PREVENTION

Practice	Description
Minimization of Fugitive Dust	1) Drop points to storage areas shall be designed to minimize the overall exposed (or exposed to the atmosphere) drop height 2) Periodic equipment maintenance shall be performed to maintain offloading locations and associated drop point integrity. Appropriate plant records shall be maintained on transportation equipment maintenance performed. 3) Daily observations of the off/up-loading and transportation and associated drop point integrity to identify any equipment abnormalities 4) Plant personnel shall be trained on identification of warning signs for potential equipment malfunction 5) Signs shall be posted identifying potential warning signs of equipment malfunction 6) Plant personnel shall visually observe truck offloading operations and if excessive fugitive dust is detected appropriate fugitive dust minimization techniques shall be implemented including water spray. Plant personnel shall be trained on procedures for defining and minimizing excessive dust from the truck unloading operations.
Storage Pile Management	1) Storage areas shall be managed to avoid excessive wind erosion. The material will be stored in the Proposed storage area, only, which is covered and protected from wind 2) Mechanical moving by front end loaders and other supporting equipment shall be minimized on high wind event days. 3) Daily visual observations of the storage area shall be performed and if conditions are right for fugitive dust formation, procedures from the fugitive dust plan shall be implemented including water spray

Fire Prevention/ Spontaneous Combustion Minimization	1) The current Emergency Response Plan includes: a. Requirement to train onsite personnel to handle incipient fires and training on the identification of potential fire hazards; and b. Install and maintain equipment for plant personnel to handle incipient fires 2) Daily observations of the storage area shall be performed by plant personnel to identify potential fire hazards. Plant personnel shall be trained on identification of potential fire hazards. 3) Compaction of recovered materials in the storage areas shall be minimized
Quality Assurance of Recovered Materials	1) The materials will be delivered to the Plant in vehicles designed to prevent release 2) For each shipment of material, the permittee shall record the date, quantity and a description of the material received as described in the **Quality Assurance Plan** 3) The permittee shall inspect each shipment of material. If the permittee identifies any such material that is not the expected material, the material shall be rejected and returned to the supplier. Rejected materials shall be moved off site in a logistically reasonable time period. 4) The permittee shall maintain records of rejected shipments and disposition thereof. Such records shall be made available to the Department upon request.

Quality Assurance Plan – Alternative Materials

CEMEX Construction Materials Florida, LLC – Brooksville South Cement Plant

The Quality Assurance Plan described below will be followed for sampling, collection, and analysis of all recovered materials received, stored, and used at the Brooksville South Cement Plant.

CEMEX shall provide each material supplier with a copy of the air construction permit including the following (Criteria for Material Suppliers).

Agricultural Plastics

This material must consist of non-chlorinated, low-density polyethylene (LDPE) and/or high-density polyethylene (HDPE) plastic used primarily in agricultural and silvicultural operations to prevent weed growth, control soil erosion and moisture exposure. The maximum representative storage/sampling pile size for this alternative fuel material is 60 tons. The composite samples must also be analyzed for pesticides, bromine and thallium.

Tire-Derived Fuel (TDF)

This material must consist of shredded used tires and may have some steel belt material. The maximum representative storage/sampling pile size for this alternative fuel material is 75 tons. The composite samples must also be analyzed for zinc.

Manufacturer Reject Roofing Shingles

This material shall consist of never before used reject shingles. The incombustible grit material shall be practically removed from the shingles. The material supplier must obtain a copy of the manufacturer certification that shows the reject shingles are "asbestos free" and present a copy of the certification to the CEMEX Cement Plant prior to, or along with any shipment. The maximum representative storage/sampling pile size for this alternative fuel material is 200 tons. The composite samples must also be analyzed for manganese, nickel and zinc.

Clean Woody Biomass

This material may include clean untreated lumber, tree stumps, tree limbs, slash, bark, sawdust, sander dust, wood chips scraps, wood scraps, wood slabs, wood millings, wood shavings, and processed pellets made from wood or other forest residues. This material excludes copper-chromium-arsenic (CCA)-treated wood, creosote-treated wood, construction and demolition (C&D) debris, plywood, particle board, medium density fiberboard, oriented strand board, laminated beams, finger-jointed trim and sheet goods. The maximum representative storage/sampling pile size for this alternative fuel material is 200 tons.

Agricultural Organic Fibrous Byproducts

This material includes peanut hulls, rice hulls, corn husks, citrus peels, cotton gin byproducts, animal bedding, etc. Other similar types of materials of organic fibrous byproducts may be tried with prior written approval of the Department. The maximum representative storage/sampling pile size for this alternative fuel material is 200 tons. Note that the CEMEX Cement Plant cannot accept more than 5,000 tons of any single type of this material and no more than a total of 25,000 tons of all agricultural organic fibrous byproducts.

Pre-Consumer Paper

This material must consist of pre-consumer paper such as: printing and writing paper; household and sanitary paper;

wrapping and packaging paper; paper board; chipboard; Kraft liner, writing and packaging paper; fluting; other wrapping and\packaging paper; folding boxboard; other paperboard; polymer laminated wrapping paper; game boards and boxes; foil wrapping paper; thermal papers; specialty papers for filtration or hygienic applications; adhesive labels; waxed corrugated cardboard; and other miscellaneous coated papers. This group of materials also includes fabrics and textiles such as dyed/finished natural fibers, dyed/finished natural fiber woven/scrap trim, polymer fiber woven scrap trim, and undyed/ unfinished natural or synthetic fiber scrap trim. If the pre-consumer paper is segregated by the specific paper type, then the maximum representative storage/sampling pile size is 200 tons. If the pre-consumer paper types are mixed, then the maximum representative storage/sampling pile size is 100 tons.

Carpet-Derived Fuel

This material consists of shredded used carpet. The maximum representative storage/sampling pile size for this alternative fuel material is 100 tons.

CRITERIA FOR MATERIAL SUPPLIERS

Accepting Shipments of Alternative Fuels:

The permittee shall receive alternative fuel materials only in covered trucks (approximately 20 tons per truckload). The alternative fuel materials shall remain in trailers or be unloaded to a paved area or compacted clay surface and stored under cover. No more than 5,000 tons of agricultural organic fibrous byproducts shall be stored on site at any given time. The permittee shall obtain copies from the material supplier of manufacturer certifications, analytical results and the amount (tons) for each delivery. A delivery may consist of more than one truckload.

1. Material suppliers must use best efforts and good housekeeping practices to keep unwanted substances and incombustible materials from mixing with the alternative fuel materials.

2. All alternative fuel materials must be properly shredded and sized before being delivered to the CEMEX Cement Plant. Each material supplier must develop QA/QC procedures to exclude foreign materials (e.g., painted material, treated material, metals, soils and incombustibles) from the alternative fuel materials.

3. The material supplier must take at least eight random grab samples (approximately 1 lb) from the maximum representative storage/sampling pile size specified below for each alternative fuel material. The eight grab samples will be combined and thoroughly mixed. A composite sample (approximately 2 lb) will be made from mixed grab samples. The composite sample will be split into two duplicates (approximately 1 lb each). Each sample will be labeled with the date, time, and sampling staff name. The source material will be segregated from other materials until the analytical results are received.

4. Each composite sample must be submitted to an appropriate testing lab. The duplicate sample will be retained by the material supplier in case a second analysis is needed. The testing lab will analyze each composite sample for: heating value, moisture, density, volatiles, ash, sulfur, chlorine, fluorine and metals (including arsenic, cadmium, chromium, copper, lead and mercury). Additional analyses are required below for each alternative fuel material.

5. The material supplier must obtain the representative analytical results from the lab before the alternative fuel material can be delivered. The material supplier must provide a copy of the analytical results to the CEMEX Cement Plant prior to, or along with, any shipment of alternative fuel materials.

6. Each alternative fuel material shall be transported in covered trucks.

Criteria for Trial Burn Sampling and Analysis:

Sampling/Analyses: At least once every four hours while firing an alternative fuel material, the permittee shall take a grab sample of as-fired material (approximately one gallon) from the front loader bucket before being dumped into the feed bin of the Schenck feeder system. At the end of each day, the grab samples shall be thoroughly mixed and a composite sample made (approximately 2 lb). Each representative composite sample shall be analyzed for the following: heating value, moisture, density, volatiles, ash, sulfur, chlorine, fluorine and metals (including arsenic, cadmium, chromium, copper, lead and mercury). The composite samples for non-chlorinated agricultural plastics shall also be analyzed for pesticides, bromine and thallium. The composite samples for TDF shall also be analyzed for zinc. The composite samples for manufacturer reject roof shingles and roofing shingle scraps shall also be analyzed for manganese, nickel and zinc.

Acceptable Analysis Methods:

CEMEX shall use the following analytical methods to determine the composition of the alternative material. Other equivalent methods may be used with prior written approval from the Bureau of Air Regulation.

Parameter	**Analytical Methods**
Moisture, Volatiles, Ash and Fixed Carbon	Proximate Analysis appropriate for given fuel
Carbon, Hydrogen, Nitrogen Sulfur and Oxygen	Ultimate Analysis appropriate for given fuel
Heating Value	ASTM E711 - 87(2004) Standard Test Method for Gross Calorific Value of Refuse-Derived Fuel by the Bomb Calorimeter, or ASTM D5468 - 02(2007) Standard Test Method for Gross Calorific and Ash Value of Waste Materials
Chlorine, Fluorine and Bromine	EPA SW-846 or EPA Method 9056
Mercury	EPA 7470A/7471A
Other Metals	EPA SW-846 or EPA Method 6010B
Pesticides	EPA SW-846 3500 or EPA 3550/8150, Test Methods for Evaluating Solid Waste

PROJECT ESTIMATED EMISSIONS

Estimated emissions are addressed in the following sections for each requested test material. Baseline emissions are calculated in detail in Appendix 2 for coal using the hierarchy of data per 62-210.370, F.A.C. The coal emission factors for NO_x, SO_2, CO and THC (as VOC) are based on facility CEMs data. Emission factor of PM is based on the average of emission tests performed since construction. Mercury emissions are based on material analysis and assume to be 100 percent emitted. Lead emissions are based on EPA Toxic Release Inventory guidance documents for metal content and 90 percent control.

It should be stressed that while emission estimates are addressed, the Brooksville South Cement Plant will not exceed any current permit limit. These short-term trials will allow CEMEX to determine if these materials, when used as supplemental fuel in the kiln system, produce emissions that are reasonably well controlled given the properties and behavior of the material. As discussed above, if a trial testing material is evaluated and determined to be feasible and acceptable to the DEP, a long-term construction permit will be submitted to establish long-term testing limitations and to construct a more permanent system.

Based on the details in the following sections, Table 3 summarizes the estimated emissions from these materials. It should be noted that even though the primary focus of these short-term tests is for feasibility determination for the recovered materials, the summary indicates that estimated emissions for any or all tests should not exceed the values of PSD thresholds.

Notwithstanding the calculation of estimated emissions, the following discussion is provided on current methods to control pollutant emissions applied at the Brooksville South Cement Plant.

CARBON MONOXIDE EMISSIONS

Carbon Monoxide (CO) emissions are not expected to increase since they can be controlled through the process of complete combustion. CEMEX will closely monitor the combustion of all fuel materials to ensure there is no partial combustion which could create CO emissions, as well as other constituents. The Brooksville South Cement Plant is designed for the use of alternate fuels with reduced volatile content and a large partial sizing by having the addition of a separate calciner chamber. This separate calciner chamber is referred to as a Combustion Chamber. The Combustion Chamber allows for the introduction of alternative fuels along with kiln feed, tertiary air (ambient air/combustion air) and

mixing with other fuels (fine coal) to insure proper ignition with retention in a high temperature atmosphere to initiate combustion of the alternate fuel.

In addition, the preheater is designed to extend retention time to provide long residence time at high temperatures to complete the combustion process. CEMEX will closely monitor the volatile content and particle sizing of the processed fuels along with the combustion characteristics of the preheater/calciner to insure proper combustion of all fuel. Currently, the Brooksville South Cement Plant operates with an oxygen rich combustion environment through the calciner and preheater assisting in the combustion process. CEMEX monitors CO with process monitors to insure proper combustion. Proper combustion will be maintained through process controls such as changes in the location of the introduction of tertiary air, increases in process draft and oxygen content through the process, changes in fine coal feed rates into the Combustion Chamber, and/or changes in the kiln feed rates.

Through testing and monitoring of the recovered materials prior to introduction and with combustion characteristics monitoring and process adjustments, CEMEX will be able to ensure proper and complete combustion of the alternate fuel with no generation of constituents of partial combustion, such as CO.

Nitrogen Oxide Emissions

Nitrogen Oxide (NO_x) emissions are not expected to change since they can be controlled by adjustments to the multistage combustion system timing, fuel input rates, and the selective non-catalytic reduction (SNCR) system.

Dioxin/Furans Emissions

Emissions of dioxin/furans (D/F) are not expected to change when using these alternate fuels due to the formation of D/F as a function of exhaust gas residence time and particulate matter loading when at a temperature range of 700°F to 400°F, which is independent of the fuel type. The fuel type impact on particulate matter loading is minimal (less than 10 percent) given the bulk of particulate matter originates from the raw materials.

TABLE 3. SUMMARY OF ESTIMATED EMISSIONS FOR RECOVERED MATERIALS TESTS
CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC – BROOKSVILLE SOUTH CEMENT PLANT

	SO_2 Inc./Dec. (tons)	NO_x Inc./Dec. (tons)	CO Inc./Dec. (tons)	VOC Inc./Dec. (tons)	PM/PM10 Inc./Dec. (tons)	PM2.5[a] Inc./Dec. (tons)	Hg Inc./Dec. (lbs)
Fugitives	0.00	0.00	0.00	0.00	1.71	0.15	0.00
Agricultural Film	0.00	0.00	0.00	0.00	0.00	0.00	-1.47
Agricultural Waste	0.69	-2.84	8.19	0.76	2.75	1.37	-1.20
Carpet-Derived Fuel	0.00	0.00	0.00	0.00	0.00	0.00	2.52
Clean Woody Biomass	1.20	-4.92	14.20	1.32	4.77	2.38	-4.05
Manufacturer Reject Roofing Shingles	0.18	-20.01	0.00	1.03	0.00	0.00	-3.25
Preconsumer Paper	0.75	-3.08	8.87	0.82	2.98	1.49	-2.93
Tire Derived Fuel	-0.08	-3.87	22.77	-0.08	-0.24	-0.12	-5.76
On-Spec Used Oil	11.94	-2.07	-2.24	9.64	0.80	0.40	0.00
Total	14.70	-36.79	51.80	13.49	12.76	5.68	-16.14
PSD Threshold	40	40	100	40	25/15	10	permit: 122 lb/yr

a. PM2.5 from Fugitives in Table 2. PM2.5 from alternative fuel firing conservatively estimated at 50% of fraction of PM.

AGRICULTURAL FILM

This plastic film is used in agriculture and silviculture to prevent weed growth and control soil erosion and moisture exposure. The film is a combination of LDPE and/or HDPE, non-chlorinated plastics. The material can be readily obtained in the community surrounding the Brooksville South Cement Plant. The energy content per ton for these films (polyethylene) is greater than that of coal. The high temperatures, long residence times, and inherent scrubbing that take place within a cement kiln calciner provides an environment conductive to the efficient combustion of this film. Currently, agricultural film is disposed of in landfills or open burned in fields.

FIGURE 5. POTENTIAL AGRICULTURAL FILM USE BASED ON TOMATO PRODUCTION

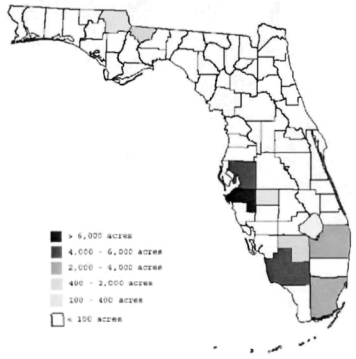
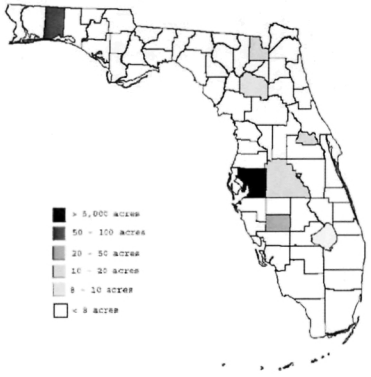


FIGURE 6. POTENTIAL AGRICULTURAL FILM USE BASED ON STRAWBERRY PRODUCTION



Material Source

The film will be supplied by suppliers from Resource Recovery Facilities, such as Envirocycle in Ft. Lauderdale, FL. Similar suppliers are available to provide source material. See Figures 5 and 6 for estimated supply densities.

Estimated Emissions

Agricultural film emission data are not available for cement kiln system combustion. EPA AP-42, Tables 2.5-7 and 2.5-8 provide emission factors for open burning of agricultural film. Other studies have been performed for silviculture[18]. These factors are not comparable to kiln combustion. The EPA review of alternative fuels and materials drafted in 2008 does not indicate other cement plants trial testing agricultural film[20]. Plastics are considered by EPA as an emerging fuel material. Also, the use of plastics as fuel in Europe has increased in recent years[5]. Agricultural film has all of the benefits and minimal barriers of technical drawbacks of most waste plastics[4] (Table ES-5 of reference). Though several U.S. cement plants (LaFarge/Systech, Sugar Creek, MO; Lehigh Cement, York, PA; TXI, New Braunfels, TX) have tested plastics, estimated emissions from this film (polyethylene) are not available. Material analysis of polyethylene is provided below:

Polyethylene – Chemical Composition and Physical Properties[19]

Volatiles (wt. %)	100
Ash (wt. %)	0
Carbon (wt. %)	85.4 – 86.4
Hydrogen (wt. %)	13.5 – 14.3
Sulfur (wt. %)	0 – 0.08
Nitrogen (wt. %)	0
Oxygen (wt. %)	0 – 0.2
Chlorine (wt. %)	0
Heat Value (MJ/kg)	40.5
Density (g/cm^3)	0.910 – 0.940
Degree of Crystallinity (%)	45 – 55
Melting Point Range (°C)	105 – 115

The high volatility and purity of this material should result in air pollution emissions comparable to, or lower than that of coal. Thus, emissions are estimated to be similar to, or less than coal emissions. Baseline emission factors from the Brooksville South Cement Plant are provided in the following table based on the hierarchy of data per 62-210.370, F.A.C. (see details in Appendix 2). Agricultural film emissions are estimated in the following table and compared to baseline emissions from the calorific equivalent in the coal used by the facility. Emissions of mercury or other metals should be no more than that of coal given that feedstock material to polyethylene is purified petroleum materials, similar to tires.

TABLE 4. ESTIMATED EMISSIONS COMPARISON BETWEEN COAL AND AGRICULTURAL FILM
CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC – BROOKSVILLE SOUTH CEMENT PLANT

Agricultural Film

Material Comparison:

	Coal (wet)	Material (wet)	
Moisture Content	4.20%	0.5%	percent
Heat Content	13,350	18,600	btu/lb
Heat Content	26.7	37.2	mmbtu/ton
Max. Heat Input	390	117	mmbtu/hr
Max. Fuel Input	14.6		tons/hr
30% of Max. Fuel Input	4.38	3.15	tons/hr
Trial Amount		3,000	tons

Emissions Comparison:

		Quantity	Emission Factor	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu)	(tons)	(tons)
SO_2	Test Material[a]	3,000	1.85E-03	0.10	0.00
	Coal Equivalent[b]	4,180	1.85E-03	0.10	
NO_x	Test Material[a]	3,000	5.85E-01	32.63	0.00
	Coal Equivalent[b]	4,180	5.85E-01	32.63	
CO	Test Material[a]	3,000	3.27E-01	18.24	0.00
	Coal Equivalent[b]	4,180	3.27E-01	18.24	
VOC	Test Material[a]	3,000	1.37E-02	0.76	0.00
	Coal Equivalent[b]	4,180	1.37E-02	0.76	
PM	Test Material[a]	3,000	8.36E-03	0.47	0.00
	Coal Equivalent[b]	4,180	8.36E-03	0.47	

		Quantity	Metals Concentration	Percent Captured[f]	Estimated Emissions	Difference in Emissions
		(tons)	(ppm)	(%)	(lbs)	(lbs)
Hg	Test Material[e]	3,000	0.623	0%	3.74	-1.47
	Coal Equivalent[d]	4,180	0.623	0%	5.21	
Pb	Test Material[e]	3,000	24.51	90%	14.71	-5.78
	Coal Equivalent[e]	4,180	24.51	90%	20.49	

a. Emission Factor (EF): Test material emissions assumed to be no greater than coal
b. EF: Based on CEM data, stack test data, and material usage (see attached data sheet, "Emissions Factor Data")
c. Concentration based on metals analysis performed on test material
d. Concentration based on coal analysis for 2010. Assume all Hg is emitted.
e. EPA 745-B-00-04, TRI Guidance, conservatively estimate AgFilm has same metal content as coal.
f. Percent capture based on reference 21, Table 5-4 and estimated the same for both fuels.

AGRICULTURAL BYPRODUCTS

Agricultural byproducts for this application will be defined as any fibrous organic waste materials, including:

- Peanut Hulls
- Citrus Peels
- Rice Hulls
- Cotton Gin Byproducts
- Corn Husks
- Animal Bedding

CEMEX requests the allowance to request FDEP to allow similar agricultural (e.g. bagasse) if a supply is determined viable for these trials. These materials range extensively in physical and chemical properties. For example, orange peels have a heat content of near 1,500 btu/lb and 50% moisture, while dried corn husks have a heat content of approximately 8,000 btu/lb and 15% moisture. In order to ensure the DEP of a limit of agricultural material to be tested, the total amount of agricultural material is limited to 25,000 tons. CEMEX believes that the range of materials can be tested for feasibility using this amount given the reality of material supply availability and costs. It should be noted that this method to remove agricultural materials from fields will potentially reduce the nutrient loading to surrounding water bodies of significant concern and recent regulatory activity.

Material Source

The CEMEX Brooksville South Cement Plant is located in North Brooksville and is in the heart of farm country. CEMEX will work with farms, distributors, and processors to develop a supply of agricultural byproducts suitable for use in its cement manufacturing process. Although many agricultural byproducts are biodegradable and useable as fertilizer, often wastes that are fibrous in nature do not readily decompose. These wastes may contain significant energy content. Many research programs today are geared towards developing bioreactors capable of breaking down this plentiful waste material, but a low cost, readily available alternative is already presented via use in cement kilns. The design and operation of cement kilns make it possible to feed many different types of fuel into the system for energy recovery at low costs to farmers.

Estimated Emissions

The emissions that agricultural byproducts are expected to produce are anticipated to be similar to that of woody biomass. Estimates are made assuming the maximum material usage of 20,000 tons. Similarly, the metals content of agricultural byproducts is expected to be low. In line with this reasoning, the ash from other processes that combust agricultural waste is regularly used as fertilizer. This, in part, is given to the assumed low concentration of metals.

TABLE 5. ESTIMATED EMISSIONS COMPARISON BETWEEN COAL AND AGRICULTURAL BYPRODUCTS
CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC – BROOKSVILLE SOUTH CEMENT PLANT

Agricultural Byproducts

Material Comparison:

	Coal (wet)	Material (wet)	
Moisture Content	4.20%	50%	percent
Heat Content	13,350	1,500	btu/lb
Heat Content	26.7	3.0	mmbtu/ton
Max. Heat Input	390	117	mmbtu/hr
Max. Fuel Input	14.6		tons/hr
30% of Max. Fuel Input	4.38	39.00	tons/hr
Trial Amount		20,000	tons

Emissions Comparison:

		Quantity	Emission Factor	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu)	(tons)	(tons)
SO_2	Test Material[a]	20,000	2.50E-02	0.75	0.69
	Coal Equivalent[b]	2,247	1.85E-03	0.06	
NO_x	Test Material[a]	20,000	4.90E-01	14.70	-2.84
	Coal Equivalent[b]	2,247	5.85E-01	17.54	
CO	Test Material[a]	20,000	6.00E-01	18.00	8.19
	Coal Equivalent[b]	2,247	3.27E-01	9.81	
VOC	Test Material[c]	20,000	3.90E-02	1.17	0.76
	Coal Equivalent[b]	2,247	1.37E-02	0.41	
PM	Test Material[d]	20,000	1.00E-01	3.00	2.75
	Coal Equivalent[b]	2,247	8.36E-03	0.25	

		Quantity	Metals Concentration	Percent Captured[h]	Estimated Emissions	Difference in Emissions
		(tons)	(ppm)	(%)	(lbs)	(lbs)
Hg	Test Material[e]	20,000	0.04	0%	1.60	-1.20
	Coal Equivalent[f]	2,247	0.623	0%	2.80	
Pb	Test Material[e]	20,000	0.05	90%	0.20	-10.82
	Coal Equivalent[g]	2,247	24.51	90%	11.02	

a. Emission Factor (EF): AP-42, Table 1.6-2, apply the same factors as clean woody biomass
b. EF: Based on CEM data, stack test data, and material usage (see attached data sheet, "Emissions Factor Data")
c. EF: AP-42, Table 1.6-3, TOC
d. EF: AP-42, Table 1.6-1, (all fuels - 0.1 lb/mmbtu)
e. Concentration based on Permit application: Cemex Miami 0250014-031-AC. Three samples of biomass, all analyses < detection limit. Apply 1/2 DL. Att. C.
f. Concentration based on coal analysis for 2010. Assume all Hg is emitted.
g. EPA 745-B-00-04, TRI Guidance
h. Percent capture based on reference 21, Table 5-4 and estimated the same for both fuels.

CARPET-DERIVED FUELS

In the U.S., approximately 2 million tons of carpet is replaced annually. Most carpet is disposed of in landfills. In terms of beneficial reuse, the heating value of this material is similar to that of coal, and the presence of $CaCO_3$ (~30% by weight) in the backing material of the carpet is a beneficial component of cement production[14].

A typical analysis of carpet-derived fuels (CDF) is shown in the following table:

TABLE 6. CARPET-DERIVED FUEL ANALYSIS[14]

	polypropylene	nylon 6	nylon 6.6	coal
Carbon (% mass)	56.93	42.25	45.59	81.6
Hydrogen (% mass)	8.47	5.47	6.13	5.0
Nitrogen (% mass)	< 0.05	4.46	4.74	1.4
Sulfur (% mass)	0.07	0.11	0.11	1.0
Ash (% mass)	21.17	25.42	23.96	6.1
Oxygen (% mass. by difference)	13.36	22.28	19.46	4.9
Chlorine (ppm mass)	77	64	52	NA
Moisture (% mass)	0.21	0.85	0.58	2.1
Volatile matter (% mass)	69.11	61.90	65.57	24.4
Ash (% mass)	21.17	25.42	23.96	6.1
Fixed carbon (% mass, by difference)	9.51	11.83	9.89	67.4
Heat of combustion (MJ/kg)	28.10	17.17	18.81	33.26

Material Source

Materials will be supplied by certified waste haulers for processed CDF. Carpet materials are available from manufacturers of carpet in surrounding areas to MRRFs.

Estimated Emissions

CDF has been trial burned at the Lehigh cement plant in Evansville, PA. However, this testing was conducted with the CDF injected directly through an auxiliary burner to the front of the kiln. The results at that facility showed insignificant changes in PM, CO, and NO_x concentrations and an incongruent significant increase of SO_2 (the sulfur in carpet is typically 0.1%, while coal is typically 1%) The results of CDF burning in the cement kiln are not expected to be different or greater than that of coal.

The purpose of this test trial is to determine the feasibility to burn CDF. Emissions in excess of current standards are not expected during the trial period, and no modifications to existing permitted emission limits are being requested. If the co-firing of CDF results in any emissions that are not allowed by current permits, co-firing shall cease immediately.

Estimated emissions are provided in the following table.

TABLE 7. ESTIMATED EMISSIONS COMPARISON BETWEEN COAL AND CARPET-DERIVED FUEL
CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC – BROOKSVILLE SOUTH CEMENT PLANT

Carpet-Derived Fuel

Material Comparison:

	Coal (wet)	Material (wet)	
Moisture Content	4.20%	0.5%	percent
Heat Content	13,350	9,194	btu/lb
Heat Content	26.7	18.4	mmbtu/ton
Max. Heat Input	390	117	mmbtu/hr
Max. Fuel Input	14.6		tons/hr
30% of Max. Fuel Input	4.38	6.36	tons/hr
Trial Amount		6,500	tons

Emissions Comparison:

		Quantity	Emission Factor	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu)	(tons)	(tons)
SO_2	Test Material[a]	6,500	1.85E-03	0.11	0.00
	Coal Equivalent[b]	4,476	1.85E-03	0.11	
NO_x	Test Material[a]	6,500	5.85E-01	34.94	0.00
	Coal Equivalent[b]	4,476	5.85E-01	34.94	
CO	Test Material[a]	6,500	3.27E-01	19.54	0.00
	Coal Equivalent[b]	4,476	3.27E-01	19.54	
VOC	Test Material[a]	6,500	1.37E-02	0.82	0.00
	Coal Equivalent[b]	4,476	1.37E-02	0.82	
PM	Test Material[a]	6,500	8.36E-03	0.50	0.00
	Coal Equivalent[b]	4,476	8.36E-03	0.50	

		Quantity	Metals Concentration	Percent Captured[f]	Estimated Emissions	Difference in Emissions
		(tons)	(ppm)	(%)	(lbs)	(lbs)
Hg	Test Material[c]	6,500	0.623	0%	8.10	2.52
	Coal Equivalent[d]	4,476	0.623	0%	5.58	
Pb	Test Material[c]	6,500	24.51	90%	31.86	9.92
	Coal Equivalent[e]	4,476	24.51	90%	21.94	

a. Test material emissions assumed to be no greater than coal
b. EF: Based on CEM data, stack test data, and material usage (see attached data sheet, "Emissions Factor Data")
c. Conservatively assume same as coal.
d. Concentration based on coal analysis for 2010. Assume all Hg is emitted.
e. EPA 745-B-00-04, TRI Guidance
f. Percent capture based on reference 21, Table 5-4 and estimated the same for both fuels.

CLEAN WOODY BIOMASS

The CEMEX Brooksville South Cement Plant is located in a rural area which has a plentiful supply of clean woody biomass. Only clean woody biomass will be used for trial burns. This includes clean untreated lumber, tree stumps, tree limbs, slash, wood residue, bark, sawdust, sander dust, wood chips, scraps, slabs, millings, shavings, and processed pellets made from wood or other forest residues. Some of these materials are further outlined in Table 8 below. CEMEX specifically clarifies that clean wood excludes secondary residues, such as plywood, particle board, medium density fiberboard (MDF), oriented strand board (OSB), laminated beams, finger jointed trim, and sheet goods. These secondary residues and other materials not on the list cannot be used as fuel without prior approval of the DEP.

Table 8. Summary of Woody Biomass Fuel Types

Descriptions Fuel Group	Description
Field residuals and slash	Tops, limbs and whole tree soft or hardwoods that result from harvest and/or thinning as well as the residue
Understory	Forest understory including smaller trees and saplings
Land clearing and storm debris	Tree parts and/or branches that have been cut down for land development or line clearing purposes or that have been gathered after storms.
Production residuals	Butts, sticks, pole ends and tree surgeon material
Saw mill waste	Saw dust and kerf waste from cutting/milling whole green trees
Planer mill shavings	Fines from planing kiln-dried lumber
Source separated construction wood waste	Clean construction wood waste that was a primary mill product and has not been treated in any way such as pallets, dimensional lumber, clean wood trim, clean milled lumber

Material Sources

The source material for woody biomass will come from permitted recycling facilities or contracted companies that service tree trimming operations.

Estimated Emissions

Representative data of emissions from wood testing in kilns is expected to be approved soon for the CEMEX Miami Cement Kiln. These data should show comparable emissions impacts for clean woody biomass. However, for this comparison AP-42 factors for boiler combustion of wood are used in comparison to boiler combustion of coal. These emissions are provided in the following table of emissions, Table 9. While significant differences exist with these factors, they are applied as a measure to assess estimated emissions from wood burning.

Metal content was evaluated based on recent measures taken on biomass for the CEMEX Miami Cement Plant biomass permit application, Permit No. 0250014-031-AC. Mercury was measured at 0.04 ppm, and lead at 0.05 ppm.

It should be noted that emissions at the Brooksville South Cement Plant are relatively low compared to AP-42 factors for coal combustion in cement plants (Chapter 11.6). For example, PM emissions at Kiln 2 have been on average 13 percent of the AP-42 factor of 0.21 lb/ton clinker. Thus, it is expected that emissions from woody biomass will also be comparatively lower than AP-42 factors. Sampling of emissions will determine the actual pollutant rates from clean woody biomass.

TABLE 9. ESTIMATED EMISSIONS COMPARISON BETWEEN COAL AND CLEAN WOODY BIOMASS
CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC – BROOKSVILLE SOUTH CEMENT PLANT

Clean Woody Biomass

Material Comparison:

	Coal (wet)	Material (wet)	
Moisture Content	4.20%	40%	percent
Heat Content	13,350	5,200	btu/lb
Heat Content	26.7	10.4	mmbtu/ton
Max. Heat Input	390	117	mmbtu/hr
Max. Fuel Input	14.6		tons/hr
30% of Max. Fuel Input	4.38	11.25	tons/hr
Trial Amount		10,000	tons

Emissions Comparison:

		Quantity	Emission Factor	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu)	(tons)	(tons)
SO_2	Test Material[a]	10,000	2.50E-02	1.30	1.20
	Coal Equivalent[b]	3,895	1.85E-03	0.10	
NO_x	Test Material[a]	10,000	4.90E-01	25.48	-4.92
	Coal Equivalent[b]	3,895	5.85E-01	30.40	
CO	Test Material[a]	10,000	6.00E-01	31.20	14.20
	Coal Equivalent[b]	3,895	3.27E-01	17.00	
VOC	Test Material[c]	10,000	3.90E-02	2.03	1.32
	Coal Equivalent[b]	3,895	1.37E-02	0.71	
PM	Test Material[d]	10,000	1.00E-01	5.20	4.77
	Coal Equivalent[b]	3,895	8.36E-03	0.43	

		Quantity	Metals Concentration	Percent Captured[h]	Estimated Emissions	Difference in Emissions
		(tons)	(ppm)	(%)	(lbs)	(lbs)
Hg	Test Material[e]	10,000	0.04	0%	0.80	-4.05
	Coal Equivalent[f]	3,895	0.623	0%	4.85	
Pb	Test Material[e]	10,000	0.05	90%	0.10	-18.99
	Coal Equivalent[g]	3,895	24.51	90%	19.09	

a. Emission Factor (EF): AP-42, Table 1.6-2, the majority of the biomass is wood
b. EF: Based on CEM data, stack test data, and material usage (see attached data sheet, "Emissions Factor Data")
c. EF: AP-42, Table 1.6-3, TOC
d. EF: AP-42, Table 1.6-1, (all fuels - 0.1 lb/mmbtu)
e. Concentration based on Permit application: Cemex Miami 0250014-031-AC. Three samples of biomass, all analyses < detection limit. Apply 1/2 DL. Att. C.
f. Concentration based on coal analysis for 2010. Assume all Hg is emitted.
g. EPA 745-B-00-04, TRI Guidance
h. Percent capture based on reference 21, Table 5-4 and estimated the same for both fuels.

MANUFACTURER REJECT ROOFING SHINGLES

Manufacturers of asphalt roofing shingles reject a certain fraction of roofing shingle product. This product contains significant heat content and raw materials of a very consistent composition. This material is an excellent source of valuable raw material and heat content for cement production. Shingles are no longer manufactured with asbestos, and the manufacturer will provide written certification of this assertion.

Roofing shingles are produced by impregnating either organic felt produced from cellulose fibers, or glass felt produced from glass fibers, with a hot saturant asphalt. This felt is subsequently coated on both sides with more asphalt and finally surfaced with mineral granules.

The largest component of roofing shingles (60 to 70 percent by mass) is the mineral material. The components of asphalt shingles are further outlined in Table 9 below. There are several different types of this material in each shingle. This fraction of mineral content is evident in the shingle material analysis in Appendix 2 (ash content of 70 percent). The mineral components of shingles can include ceramic granules (comprising crushed rock particles, typically trap rock coated with colored, ceramic oxides), lap granules (coal slag ground to roughly the same size as the ceramic granules), backsurfacer sand (washed, natural sand used in small quantities to keep packaged shingles from sticking together), and asphalt stabilizer (powdered limestone that is mixed into the asphalt).

TABLE 10. COMPONENTS OF ASPHALT SHINGLES[19]

Component	Approximate Amount by Weight	Notes
Asphalt Cement	25-35	Generally of two types (saturant and coating)
Granular Material	60-70	Ceramic granules, Headlap granules, Backsurfacer sand, and Asphalt stabilizer
Backing	5-15	Cellulose only or glass felt

Material Source

Shingle manufacturers will supply reject roofing shingle. Certification of asbestos free materials will be provided to CEMEX prior to entering into a supplier relationship with any manufacturer, and records of such certification shall be stored onsite for DEP review.

Estimated Emissions

The contents of manufacture reject shingles are provided in Table 9. Analysis of reject shingles is provided in Appendix 2.

SO_2

The sulfur content of shingles is 0.79 percent. Given the amount of sulfur in coal used at the Brooksville South Cement Plant (2010 monthly analysis) is 0.67 percent, the emissions from shingles (assuming similar combustion efficiency) can be broadly estimated by the ratio of 0.79/0.67 = 1.18, compared to that of coal on a mass basis, and 13,350/5,842 = 2.29, compared to that of coal on a heat content basis. For estimated SO_2 emissions, a factor of (1.18 x 2.29) 2.69 times the coal SO_2 emission factor (0.0499 lb/mmBtu) is applied.

NO_x

The fraction of nitrogen in shingles is 0.27 percent in comparison that that typical of coal at 1.49 percent. NO_x formation due to fuel in the precalciner should be less when co-firing reject shingles given their lower nitrogen content when compared to coal. Furthermore, most NO_x is generated by thermal NO_x in the main kiln combustion chamber versus the precalciner. The precalciner maximum temperature peaks near 2,000°F while the kiln peaks near 3,500°F. The NO_x formation is conservatively to be less for shingles than that of coal using the ratio of nitrogen content (0.27/1.49). A NO_x emission factor of (0.27/1.49 x 13,350/5,842 x 0.585 lb/mmBtu) 0.242 lb/mmBtu is applied.

CO

CO emissions should be similar to coal as CO is based on operation of the tertiary air system as discussed in the Project Estimated Emissions section. The carbon content of coal and shingles is similar (approximately 25-30 percent).

VOC

If coal and shingles have the same combustion efficiency, the formation of VOCs could be suggested to vary by the ratio of volatile content and heat content. Based on these assumptions, the VOC emission factor is estimated to be (13,350/5,842 x 0.137 lb/mmBtu) 0.313 lb/mmBtu.

PM

While PM emission factors for shingles do not exist, studies of alternate fuels in German cement plants have been shown to not significantly increase PM emissions, in part, based on the logic that uncontrolled PM emissions from fuels in cement kilns are less than $1/10^{th}$ of the fraction of the PM emissions controlled from cement raw materials[5]. Thus PM emissions are not expected to significantly increase. Therefore, the PM emission factor for coal is applied for shingles.

TABLE 11. ESTIMATED EMISSIONS COMPARISON BETWEEN COAL AND MANUFACTURER REJECT SHINGLES

CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC – BROOKSVILLE SOUTH CEMENT PLANT

Manufacturer Reject Roofing Shingles

Material Comparison:

	Coal (wet)	Material (wet)	
Moisture Content	4.20%	3.1%	percent
Heat Content	13,350	5,842	btu/lb
Heat Content	26.7	11.7	mmbtu/ton
Max. Heat Input	390	117	mmbtu/hr
Max. Fuel Input	14.6		tons/hr
30% of Max. Fuel Input	4.38	10.01	tons/hr
Trial Amount		10,000	tons

Emissions Comparison:

		Quantity	Emission Factor	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu)	(tons)	(tons)
SO_2	Test Material[a]	10,000	4.99E-03	0.29	0.18
	Coal Equivalent[b]	4,376	1.85E-03	0.11	
NO_x	Test Material[c]	10,000	2.42E-01	14.14	-20.01
	Coal Equivalent[b]	4,376	5.85E-01	34.16	
CO	Test Material[d]	10,000	3.27E-01	19.10	0.00
	Coal Equivalent[b]	4,376	3.27E-01	19.10	
VOC	Test Material[e]	10,000	3.13E-02	1.83	1.03
	Coal Equivalent[b]	4,376	1.37E-02	0.80	
PM	Test Material[f]	10,000	8.36E-03	0.49	0.00
	Coal Equivalent[b]	4,376	8.36E-03	0.49	

		Quantity	Metals Concentration	Percent Captured[h]	Estimated Emissions	Difference in Emissions
		(tons)	(ppm)	(%)	(lbs)	(lbs)
Hg	Test Material[g]	10,000	0.11	0%	2.20	-3.25
	Coal Equivalent[h]	4,376	0.623	0%	5.45	
Pb	Test Material[e]	10,000	21	90%	42.00	20.55
	Coal Equivalent[i]	4,376	24.51	90%	21.45	

a. Emission Factor (EF): AP-42, Table 1.3-1, No. 6 oil, >100 mmbtu/hr,0.79%sulfur (see Appendix 3 analysis), 95+% control
b. EF: Based on CEM data, stack test data, and material usage (see attached data sheet, "Emissions Factor Data")
c. EF: See Section "Manufacturer eject Shingles" discussion on nitrogen fraction in shingles versus coal
d. EF: See Estimated Emissions discussion of control of CO
e. EF: See Estimated Emissions section for VOC factor
f. EF: Test material emissions assumed to be no greater than coal
g. See appendix 3 for metals concentration
h. Concentration based on coal analysis for 2010. Assume all Hg is emitted.
i. EPA 745-B-00-04, TRI Guidance
j. Percent capture based on reference 21, Table 5-4 and estimated the same for both fuels.

PRE-CONSUMER PAPER

CEMEX requests to transport, store, and process pre-consumer reject paper that is produced by companies specifically marketing such products (e.g., International Paper Products Corp (IPP), enviro-fuel cubes) or waste handlers that certify and manifest to only supply pre-consumer reject paper. Typical sources of such paper are manufacturers having a supply of outdated paper printings (e.g. calendars) that must dispose of the material in some manner. Example material sources are listed below.

The obvious benefit of these materials is that consumers have not been able to potentially contaminate the paper. As such, the quality of the product is much more reliable and the potential to contaminate (e.g., mercury containing materials) is essentially negated.

These materials contain high amounts of energy and are relatively slow to biodegrade in landfills. They have also been successfully used at cement facilities in the U.S. and around the world.

Material Source

CEMEX shall accept only uniform supplies of these materials from manufacturers, permitted Florida recycling facilities, or from contractors that prescribe to certify the manufacturing source(s) of the materials.

Table 12. Typical Sources of Pre-Consumer Paper

Feedstock Material & Examples	Typical Sources
Paper	
Printing & Writing Paper	Original Article Manufacturers
Pre-consumer Household & Sanitary Paper	Paper Goods Manufacturers and Converters
Wrapping & Packaging Paper and Paper Board	Game/Novelty Manufacturers/Distributers
Linerboard (chipboard)	Packaging Operations
Kraft Liner	Commercial and Retail Packaging Discards
Fluting (corrugated interiors)	Institutional Discards
Kraft Wrapping & Packaging	References: http://www.fao.org/ http://www.faor.org/docrep/w5622t/w5622t4o.htm
Other Wrapping and Packaging Paper	
Folding Boxboard	
Other Paper Board (NES) (Box Liners, Laminated Surfaces)	
Fabrics – Textiles – Natural Fibers	
Dyed/Finished Natural Fiber Curtains (Cotton, Linen, Rayon, Wool)	Original Article Manufacturers (Curtain/Clothing Makers)
Dyed/Finished Natural Fiber Woven Scrap/Trim	Game/Novelty Manufacturers/Distributors
Polymer Fiber (nylon, polyester) Woven Scrap/Trim	Commercial and Retail Discards and Scrap, and Packaging Media
Undyed/Unfinished Natural or Synthetic Fiber Scrap/Trim	Secondary Manufacturer Discards and Scrap (Fabric added to article)

Coated Paper	
General Note: Most papers have a coating. It is usually clay or other inert material and can also include polymer/rubber or latex compounds. Coated papers in this category are those to which a second coating has been added in the form of a polymer film, additional paper laminate, metalized foils (Aluminum) and other similar applications. These materials are primarily at least one more process or downstream manufacturer from the retail market.	
Polymer Laminated Wrapping Paper (Printed Sandwich Wrap)	Original Article Manufacturers)
Game Boards and Boxes (Printed Kraft glued to Boxboard)	Paper Goods Manufacturers and Converters
Foilized Wrapping Paper (Gift Wrap, Specialty Finished Coverings)	Game/Novelty Manufacturers/Distributers
Thermal Papers (Gas Station Receipts)	Packaging Operations
NCR Forms (No Carbon Multiple Copy Forms)	Commercial and Retail Packaging Discards
Specialty Papers for Filtration of Hygienic Applications (Diapers)	Institutional Discards
Adhesive Labels (Retail Beverage Containers, Ski Lift Tickets)	
Waxed Corrugated Cardboard (Watermelon Cartons)	
Other Specialty Coatings (Lottery Ticket Stock, Instant Oatmeal Pouches)	

Expected Emissions

The emissions from processed paper injected into the precalciner should be similar to that of woody biomass. The burning of shredded paper should be more efficient than biomass, as paper is a two-dimensional fuel source with maximum surface area to combust.

The metals emissions should be low in reject paper. Analytical results from IPP are included in Appendix 2 showing a mercury content averaging 0.01 ppm and a lead content averaging 8.5 ppb. These values are applied in the estimated emissions, which are provided in Table 12 below.

TABLE 13. ESTIMATED EMISSIONS COMPARISON BETWEEN COAL AND PRE-CONSUMER PAPER

CEMEX Construction Materials Florida, LLC – Brooksville South Cement Plant

Pre-consumer Paper

Material Comparison:

	Coal (wet)	Material (wet)	
Moisture Content	4.20%	16%	percent
Heat Content	13,350	6,500	btu/lb
Heat Content	26.7	13.0	mmbtu/ton
Max. Heat Input	390	117	mmbtu/hr
Max. Fuel Input	14.6		tons/hr
30% of Max. Fuel Input	4.38	9.00	tons/hr
Trial Amount		5,000	tons

Emissions Comparison:

		Quantity	Emission Factor	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu)	(tons)	(tons)
SO_2	Test Material[a]	5,000	2.50E-02	0.81	0.75
	Coal Equivalent[b]	2,434	1.85E-03	0.06	
NO_x	Test Material[a]	5,000	4.90E-01	15.93	-3.08
	Coal Equivalent[b]	2,434	5.85E-01	19.00	
CO	Test Material[a]	5,000	6.00E-01	19.50	8.87
	Coal Equivalent[b]	2,434	3.27E-01	10.63	
VOC	Test Material[c]	5,000	3.90E-02	1.27	0.82
	Coal Equivalent[b]	2,434	1.37E-02	0.44	
PM	Test Material[d]	5,000	1.00E-01	3.25	2.98
	Coal Equivalent[b]	2,434	8.36E-03	0.27	

		Quantity	Metals Concentration	Percent Captured[h]	Estimated Emissions	Difference in Emissions
		(tons)	(ppm)	(%)	(lbs)	(lbs)
Hg	Test Material[e]	5,000	0.01	0%	0.10	-2.93
	Coal Equivalent[f]	2,434	0.623	0%	3.03	
Pb	Test Material[e]	5,000	8.5	90%	8.50	-3.43
	Coal Equivalent[g]	2,434	24.51	90%	11.93	

a. Emission Factor (EF): AP-42, Table 1.6-2
b. EF: Based on CEM data, stack test data, and material usage (see attached data sheet, "Emissions Factor Data")
c. EF: AP-42, Table 1.6-3, TOC
d. EF: AP-42, Table 1.6-1, (all fuels - 0.1 lb/mmbtu)
e. Concentration based on Permit application: Cemex Miami 0250014-031-AC. Three samples of biomass, all analyses < detection limit. Apply 1/2 DL. Att. C.
f. Concentration based on coal analysis for 2010. Assume all Hg is emitted.
g. EPA 745-B-00-04, TRI Guidance
h. Percent capture based on reference 21, Table 5-4 and estimated the same for both fuels.

TIRE DERIVED FUEL

Tire Derived Fuel is composed of processed tires including the shredded materials from tire crumb of tires. Tire crumb is a re-use product from old tires that can be utilized in various applications, such as children playground surfaces, athletic field surfaces, car floor mats, shoes, etc.

Tire crumb can be generated in two general ways: mechanical grinding and cryogenics. First, tires are cut into smaller pieces using various forms of rotary grinders, such as hammer mills. Metal wire is vigilantly removed from the material, as it is considered a contaminant, which becomes a salable product. Thus, tirefluff contains essentially no metal. This material is then further pulverized and/or subjected to additional grinding. The purpose of freezing the material is to control the tire crumb sizing, as it is sold in categories of various sizes. Companies recover about 40-50 percent of the tire from this process, but the remainder is sent to landfills as tirefluff. This leftover material is comprised of tire rubber and the polyester/nylon fibers from the inside mesh of the tires (which serves as structural support).

FIGURE 7. IMAGE OF TIREFLUFF

Material Sources

TDF including tirefluff is expected to be supplied by Florida Tire Recycling, Inc. located in Fort Pierce, Florida or similar facility provided as approved by FDEP. This facility generates around 10,000 – 15,000 tons of tirefluff per year, most of which is currently landfilled. The parent company, Liberty Tire Company, is headquartered in Pittsburgh, PA. For additional information, reference the company website: http://www.libertytire.com/Home.aspx.

Estimated Emissions

Data are not currently available for emissions from TDF including tirefluff; however plant data are available for tires, which is the source material of tirefluff. Estimated emissions calculations are based on a similar cement plant that has conducted tire tests: CEMEX Miami Cement Plant. The information found in Table 14, below, was extrapolated to the subject facility, applying the percent increase or decrease in emissions found at the Miami Cement Plant to the equivalent factor at the Brooksville South Cement Plant.

Table 14. Comparative Emissions for TDF at the Miami Cement Plant

Tire Emissions Comparison
CEMEX Miami Cement Plant

	Measured Stack Emissions (lb/ton preheater feed)				
Tires & Coal-Fired	SO_2	NO_x	CO	VOC	PM
(Stack Test) 5/14/2008	--	--	--	--	0.038
(Stack Test) 5/12/2008	--	--	2.670	--	--
(CEMS) 4/10/08 - 4/22/08	0.027	1.675	--	0.083	--
EF =	0.027	1.675	2.670	0.083	0.038

	Measured Stack Emissions (lb/ton preheater feed)				
Coal-Fired Only (No Tires)	SO_2	NO_x	CO	VOC	PM
(Stack Test) 8/14/2007	--	--	1.259	--	0.072
(CEMS) 3/20/08 - 4/27/08	0.020	1.875	--	0.092	--
EF =	0.020	1.875	1.259	0.092	0.072

Comparative Percent Change of Emissions When Firing Tires				
SO_2	NO_x	CO	VOC	PM
33%	**-11%**	**112%**	**-10%**	**-47%**

Expected Emissions changes due to the co-firing of tirefluff are outlined in Table 14.

TABLE 15. ESTIMATED EMISSIONS COMPARISON BETWEEN COAL AND TDF

CEMEX Construction Materials Florida, LLC – Brooksville South Cement Plant

TDF

Material Comparison:

	Coal (wet)	Material (wet)	
Moisture Content	4.20%	0.5%	percent
Heat Content	13,350	13,800	btu/lb
Heat Content	26.7	27.6	mmbtu/ton
Max. Heat Input	390	117	mmbtu/hr
Max. Fuel Input	14.6		tons/hr
30% of Max. Fuel Input	4.38	4.24	tons/hr
Trial Amount		4,500	tons

Emissions Comparison:

		Quantity	Emission Factor	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu)	(tons)	(tons)
SO_2	Test Material[a]	4,500	6.18E-04	0.04	-0.08
	Coal Equivalent[b]	4,652	1.85E-03	0.12	
NO_x	Test Material[a]	4,500	5.22E-01	32.44	-3.87
	Coal Equivalent[b]	4,652	5.85E-01	36.31	
CO	Test Material[a]	4,500	6.94E-01	43.07	22.77
	Coal Equivalent[b]	4,652	3.27E-01	20.30	
VOC	Test Material[a]	4,500	1.23E-02	0.77	-0.08
	Coal Equivalent[b]	4,652	1.37E-02	0.85	
PM	Test Material[a]	4,500	4.45E-03	0.28	-0.24
	Coal Equivalent[b]	4,652	8.36E-03	0.52	

		Quantity	Metals Concentration	Percent Captured[f]	Estimated Emissions	Difference in Emissions
		(tons)	(ppm)	(%)	(lbs)	(lbs)
Hg	Test Material[c]	4,500	0.0039	0%	0.04	-5.76
	Coal Equivalent[d]	4,652	0.623	0%	5.79	
Pb	Test Material[c]	4,500	24.51	90%	22.06	-0.74
	Coal Equivalent[e]	4,652	24.51	90%	22.80	

a. Emission Factor (EF): Based on comparative emissions data from Florida Rock Industries, see Appendix 2
b. *EF: Based on CEM data, stack test data, and material usage (see attached data sheet, "Emissions Factor Data")*
c. EF: Based on metals analysis, see Appendix 2
d. Concentration based on Cemex Miami plant coal monthly analysis for 2008. Assume all Hg emitted.
e. EPA 745-B-00-04, TRI Guidance
f. Percent capture based on reference 21, Table 5-4 and estimated the same for both fuels.

On-spec Used Oil (From Off-site Sources)

The Brooksville South Cement Plant is currently permitted to use on-spec fuel oil produced on-site. CEMEX is requesting to expand this constraint to include used oil from off-site sources, so long as off-site fuel meets the standards adapted for on-spec fuel oil from 40 CFR 279.11 listed in Table 16, below.

Table 16. Properties of On-spec Used Fuel Oil
Adapted from 40 CFR 279.11

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

TABLE 17. ESTIMATED EMISSIONS COMPARISON BETWEEN COAL AND ON-SPEC USED OIL

CEMEX Construction Materials Florida, LLC – Brooksville South Cement Plant

On-spec Used Oil

Material Comparison:

	Coal (wet)	Material (wet)	
Moisture Content	4.20%	--	percent
Heat Content	13,350	19,036	btu/lb
Heat Content	26.7	38.1	mmbtu/ton
Max. Heat Input	390	117	mmbtu/hr
Max. Fuel Input	14.6		tons/hr
30% of Max. Fuel Input	4.38	3.07	tons/hr
Trial Amount		400	tons

Emissions Comparison:

		Quantity	Emission Factor	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu)	(tons)	(tons)
SO_2	Test Material[a]	400	1.57E+00	11.95	11.94
	Coal Equivalent[b]	570	1.85E-03	0.01	
NO_x	Test Material[a]	400	3.13E-01	2.39	-2.07
	Coal Equivalent[b]	570	5.85E-01	4.45	
CO	Test Material[a]	400	3.33E-02	0.25	-2.24
	Coal Equivalent[b]	570	3.27E-01	2.49	
VOC	Test Material[a]	400	1.28E+00	9.75	9.64
	Coal Equivalent[b]	570	1.37E-02	0.10	
PM	Test Material[a]	400	1.13E-01	0.86	0.80
	Coal Equivalent[b]	570	8.36E-03	0.06	

		Quantity	EF/Metals Concentration	Percent Captured[g]	Estimated Emissions	Difference in Emissions
		(tons)	(lb/mmbtu) / (ppm)	(%)	(lbs)	(lbs)
Hg	Test Material[c]	400	7.50E-07	0%	0.00	-0.71
	Coal Equivalent[d]	570	0.623	0%	0.71	
Pb	Test Material[c]	400	100	90%	8.00	5.20
	Coal Equivalent[f]	570	24.51	90%	2.80	

a. Emission Factor (EF): Based on AP42, Table 1.3-1, and Table 1.3-3, assume TOC = VOC
b. EF: Based on CEM data, stack test data, and material usage (see attached data sheet, "Emissions Factor Data")
c. EF: Based on AP42, Table 1.3-11, Mercury Emission Factor
d. Concentration based on Cemex Miami plant coal monthly analysis for 2008. Assume all Hg emitted.
e. Concentration based on worst-case scenario for imported oil
f. EPA 745-B-00-04, TRI Guidance
g. Percent capture based on reference 21, Table 5-4 and estimated the same for both fuels.

Appendix 2

AIR CONSTRUCTION PERMIT APPLICATION:

SUPPLEMENTAL MATERIALS

- Baseline Emissions Used for Coal Emissions Factors
- Analytical Results for Specific Materials

CEMEX CONSTRUCTION MATERIALS FLORIDA, LLC

BROOKSVILLE SOUTH CEMENT PLANT

FACILITY ID: 0530021

Kiln No. 2 (EU 044)

A P P E N D I X

KOOGLER & ASSOCIATES, INC.
ENVIRONMENTAL SERVICES

Lab No. 01103329

Date Rec'd. 11/02/2010

Date Sampled

Sampled By YOURSELVES

CENTRAL POWER & LIME
ATTN: MS CINDY BRAY
PO BOX 10269
BROOKSVILLE, FL 34603

STANDARD LABORATORIES, INC
Box 606
Whitesburg, KY 41858
Tel: (606) 633-9373
Fax: (606) 633-8136

OCTOBER 2010
COAL COMPOSITE

	Moisture	%Ash	%Volatile	Fixed Carbon	BTU/LB	%Sulfur
As Rec'd.	4.20	7.55	35.60	52.65	13350	0.67
Dry Basis	---------	7.88	37.16	54.96	13935	0.70
M-A-Free					15127	

LBS SO2 / MMBTU: 1.00 LBS ASH / MMBU: 5.65

FREE SWELLING INDEX: 5.5

ASH FUSION TEMPERATURES (DEG F)	REDUCING
INITIAL	2850+
SOFTENING	2850+
HEMISPHERICAL	2850+
FINAL	2850+

Respectfully Submitted, Rick Champion / Billy Mullins, Mgrs.

Original on file at Standard Laboratories, Whitesburg, KY

NOTE: XXXX INDICATES ANALYSIS WAS NOT PERFORMED

Lab No. 01103329

Date Rec'd 11/02/10

Date Sampled

Sampled By YOURSELVES

STANDARD LABORATORIES, INC
PO BOX 606
WHITESBURG, KY 41858
TEL: 606-633-9373
FAX: 606-633-8136

CENTRAL POWER & LIME
ATTN: MS CINDY BRAY
P.O. BOX 10269
BROOKSVILLE, FLORIDA 34603

Sample ID: OCTOBER 2010 COAL COMPOSITE

MINERAL ANALYSIS OF ASH	% IGNITED BASIS	
SILICON DIOXIDE:	56.31	
ALUMINUM OXIDE:	32.36	
TITANIUM DIOXIDE:	2.18	
CALCIUM OXIDE:	0.81	
POTASSIUM OXIDE:	1.71	
MAGNESIUM OXIDE:	0.96	
SODIUM OXIDE:	0.36	
PHOSPHORUS PENTOXIDE:	0.23	
FERRIC OXIDE	3.25	
SULFUR TRIOXIDE:	0.52	
BASE TO ACID RATIO:	0.0780	
SLAG VISCOSITY:	3000+	DEG F AT 250 POISE
FOULING INDEX:	0.0280	
TYPE:	LOW	
FOULING INDEX:	0.0546	
TYPE:	LOW	
ALKALIES AS Na2O:	0.12	%
SILICA RATIO:	1.74	
SILICA VALUE:	91.81	%
ULTIMATE ANALYSIS OF COAL	% DRY BASIS	
ASH:	7.88	
HYDROGEN:	5.08	
CARBON:	76.32	
NITROGEN:	1.49	
SULFUR:	0.70	
OXYGEN:	8.53	
CHLORINE IN COAL:	0.16	

RICK CHAMPION / MANAGER
BILLY MULLINS / ASSISTANT MANAGER

Lab No. 00917832

Date Rec'd 09/17/10

Date Sampled

Sampled By YOURSELVES

STANDARD LABORATORIES, INC
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WHITESBURG, KY 41858
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FAX: 606-633-8136

CENTRAL POWER & LIME
ATTN: MS CINDY BRAY
P.O. BOX 10269
BROOKSVILLE, FLORIDA 34603

Sample ID: SEPTEMBER 2010 COAL COMPOSITE

	DRY BASIS CONCENTRATION
**MERCURY	ppm

**ACTUAL TESTING PERFORMED BY SL, FREEBURG
METHOD: ASTM D6722-01 - DCGA-AA

RICK CHAMPION / MANAGER
BILLY MULLINS / ASSISTANT MANAGER

SGS

September 01, 2009

Rinker Materials Corp.
P.O. Box 650679
Miami, FL 33265
USA

Client Sample ID: Veolia Miami/Biomass **Date Sampled :** 8/12/2009
Date Received: 08/13/2009
Matrix: Wood
Net Sample Weight: 230.20 g

SGS Sample ID: 072-40854-001

		As Received	Dry	MAF
% Moisture, Total	[ASTM D 3302]	49.39		
% Ash	[ASTM D 3174/5142]	4.31	8.51	
% Volatile Matter	[ASTM D 5142]	32.09	63.41	69.31
% Fixed Carbon	[ASTM D 3172]	14.21	28.08	30.69
Gross Calorific Value (Btu/lb)	[ASTM D 5865]	3991	7885	8618
% Sulfur	[ASTM D 4239]	0.13	0.25	
% Carbon	[ASTM D 5373]	24.01	47.44	
% Hydrogen	[ASTM D 5373]	2.82	5.57	
% Nitrogen	[ASTM D 5373]	0.23	0.45	
% Oxygen (Calc)	[ASTM D 3176]	19.11	37.78	

Analyte	Result	Method
Pounds of Ash/mm Btu	10.79 lb	
Pounds of Sulfur/mm Btu	0.32 lb	
Pounds of SO2/mm Btu	0.63 lb	

Respectfully submitted,
SGS NORTH AMERICA INC.

Tony Stryk

Denver Laboratory

SGS North America Inc. | Minerals Services Division
4665 Paris Street, Suite B-200, Denver, CO 80239 t (303) 373-4772 f (303) 373-4791 www.us.sgs.com/minerals

September 01, 2009

Rinker Materials Corp.
P.O. Box 650679
Miami, FL 33265
USA

Client Sample ID: Veolia Miami/Biomass
Date Received: 08/13/2009
Matrix: Wood
Net Sample Weight: 230.20 g

Date Sampled : 8/12/2009

SGS Sample ID: 072-40854-001

Analyte	Result	Method
Ash Analysis Basis	Dry	ASTM D 4326
Silicon Dioxide SiO2	2.07 %	ASTM D 4326
Aluminum Oxide Al2O3	0.19 %	ASTM D 4326
Titanium Dioxide TiO2	0.05 %	ASTM D 4326
Iron Oxide Fe2O3	0.11 %	ASTM D 4326
Calcium Oxide CaO	3.42 %	ASTM D 4326
Magnesium Oxide MgO	0.31 %	ASTM D 4326
Potassium Oxide K2O	0.40 %	ASTM D 4326
Sodium Oxide Na2O	0.37 %	ASTM D 4326
Sulfur Trioxide SO3	0.49 %	ASTM D 4326
Phosphorus Pentoxide P2O5	0.23 %	ASTM D 4326
Strontium Oxide SrO	0.01 %	ASTM D 4326
Barium Oxide BaO	<0.01 %	ASTM D 4326
Manganese Oxide MnO2	<0.01 %	ASTM D 4326
Chlorine, Dry	5800 ug/g	ASTM D 6721
Loss on Ignition	92.33 %	ASTM D 3174

Respectfully submitted,
SGS NORTH AMERICA INC.

Tony Stryker
Denver Laboratory

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Kyle Ulmer

From: Jim Ladue <jladue@ippbiomassfuel.com>
Sent: Thursday, February 25, 2010 3:36 PM
To: 'Charles Robertson'
Cc: mlee@kooglerassociates.com
Subject: FW: Introduction of International Paper Products Corporation
Attachments: T1 Metals QA 0606-1209.pdf; T2 Prox-Ult-Cl 0706-1209.pdf; 2010-01 Trailer Portable DDU Concept SDDU3B3307 B.pdf; 2010-02-12 IPPC SRM Materials Summary.pdf

Charles,

International Paper Products Corporation (IPPC) is a Materials Life Cycle Management Company specializing in the manufacturing and co-firing of a clean alternative fuel called Enviro-Fuelcubes® (EFCs).

Please view our informational video on our website at www.ippbiomassfuel.com; Login = biomass; Password = fuel.

The key areas of benefit include the fuel attributes as a coal replacement, containerized fuel processing and delivery equipment to allow firing into the front end of the kiln, directly into the flame, local EFC manufacturing capability, and long term price protection.

Overview of EFC Attributes

The buyer would "own" any attributes (tax credits/offsets/RECS – should they ever exist) associated with use of EFC to make power/heat.

Carbon

Carbon Emissions	IPPC fuel's energy is approximately 80% biogenic carbon.	This should be "netted" out from facility emissions under propose Carbon inventory schemes from USEPA.

Metals	**Comments**	**Whole Fuel Average (36 months)**
Mercury	Feedstock's have little to no mercury other than as a contaminant in paper itself.	0.010 mg/kg
Arsenic	Feedstock's have little to no arsenic	0.72 mg/kg
Cadmium	Feedstock's have little to no arsenic	0.12 mg/kg
Lead	Feedstock contains trace concentrations due to colorants; and incorporation of traditional biomass.	8.5 mg/kg
Ash	Primarily Aluminum and Titanium Dioxides. Small concentrations of Manganese and other light metals. Ash	5% - 6%

	has been found to be non-hazardous by all parties w/ whom we work or speak to.	
Proximate/Ultimate & Chlorine	Comments	Whole Fuel Average (38 months)
HHV	Obtained in a coal fired cement kiln showed (0.9):(1.0) against 11,500 BTU/lb coal for a derived value of 10,350.	Nominal 10,000 BTU/lb.
Fixed Carbon		7%
Carbon		49%
Volatile Matter		84%
Nitrogen		0.15%
Sulfur		<0.1%
Chlorine		741 mg/kg

Containerized Fuel Processing and Delivery Equipment for Suspension Burning

IPPC provides one or more Dedensification and Delivery Units or DDU's to reduce the EFCs from a densified cube to ¼" (-) or smaller particles. These particles are "delivered" directly into the front end of the kiln. Recent pilot test experience with firing EFCs directly into the front end of the kiln provided improvement with Dioxin/Furan, NOx, CO, SO2, THC and PM. The kiln also experienced stability unlike anything seen before which was likely due to the homogeneity and low moisture associated with EFCs.

A single unit has a feed rate range of 0 to 15 tons per hour (up to 300 MMBTU/hr) and adds minimal air (3,000 CFM) to the combustion environment. The DDU can be located up to 300' from the nozzle w/ processed fuel being pneumatically conveyed via an 8" ID conduit (typically Schedule 10 tube/clamp type black piping); the unit can accommodate over 100' of lift. A diagram is attached. The DDU is road portable for test purposes. It has both local and remote (control room) controls.

Local EFC Manufacturing Capability

IPPC sources raw materials for its EFCs from "pre-consumer" industrial, commercial, retail, and institutional sectors. As the informational video explains, these raw materials have desirable attributes for solid fuel manufacture and are largely paper/cellulose fiber based. A summary of typical raw materials and their origins is attached.

Please take the time to review this information and the video presentation on our website. I am available to answer any questions you may have and look forward to speaking with you soon.

Best Regards,
Jim

IPP

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SGS

Analysis Report

December 07, 2009

ST MARYS CEMENT COMPANY
CHARLEVIOX PLANT
16000 BELLS BAY ROAD
CHARLEVOIX MI 49720

ATTN: CORTNEY SCHMIDT

Client Sample ID:	Shingles Sample	Sample ID By:	St. Mary's Cement
Date Sampled:	N/A	Sample Taken At:	Submitted
Date Received:	Oct 26, 2009	Sample Taken By:	Submitted
Product Description:	RDF OR TDF		
Comments:	NOTE: OXYGEN CAN NOT BE DETERMINED DUE TO ULTIMATE TOTALING OVER 100%.		

SGS Minerals Sample ID: 491-0940311-003

		Method	As Received	Dry
Moisture, Total %		ASTM E949	3.14	
Ash %		ASTM E830	69.72	71.97
Sulfur %		ASTM D4239 Method B	0.77	0.79
Gross Calorific Value	BTU/LB	ASTM E711	5842	6032
Carbon %		ASTM D5373	27.74	28.64
Hydrogen %		ASTM D5373	3.01	3.11
Nitrogen %		ASTM D5373	0.27	0.27
Chlorine, Cl %		ASTM D4208	0.04	0.04
Mercury, Hg	UG/G	ASTM D3684		0.11

Tests	Result	Unit	Method

Vanessa Chambliss

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December 07, 2009

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Comments:	NOTE: OXYGEN CAN NOT BE DETERMINED DUE TO ULTIMATE TOTALING OVER 100%.		

SGS Minerals Sample ID: 491-0940311-003

Tests	Result	Unit	Method
ANALYSIS OF ASH			
Basis	IGNITED	---	ASTM D4326
Silicon Dioxide, SiO2	46.96	%	ASTM D4326
Aluminum Oxide, Al2O3	12.96	%	ASTM D4326
Titanium Dioxide, TiO2	0.72	%	ASTM D4326
Iron Oxide, Fe2O3	7.74	%	ASTM D4326
Calcium Oxide, CaO	16.25	%	ASTM D4326
Magnesium Oxide, MgO	6.39	%	ASTM D4326
Potassium Oxide, K2O	1.83	%	ASTM D4326
Sodium Oxide, Na2O	2.26	%	ASTM D4326
Sulfur Trioxide, SO3	4.53	%	ASTM D4326
Phosphorus Pentoxide, P2O5	0.15	%	ASTM D4326
Strontium Oxide, SrO	0.03	%	ASTM D4326
Barium Oxide, BaO	0.09	%	ASTM D4326
Manganese Oxide, MnO2	0.09	%	ASTM D4326
Undetermined	0.00	%	ASTM D4326
Sum of Oxides	100.00	%	ASTM D4326
Silica Value	60.72	%	ASTM D4326
Base Acid Ratio	0.57	---	ASTM D4326
T250 Temperature	2264	°F	ASTM D4326
Fouling Index	2.26	%	ASTM D4326
Type of Ash	LIGNITIC	---	ASTM D4326

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Comments:	NOTE: OXYGEN CAN NOT BE DETERMINED DUE TO ULTIMATE TOTALING OVER 100%.		

SGS Minerals Sample ID: 491-0940311-003

Tests	Result	Unit	Method
TRACE ELEMENTS - DRY BASIS			
Arsenic, As	<1	µg/g	ASTM D3683
Beryllium, Be	<1	µg/g	ASTM D3683 (Mod)
Cadmium, Cd	<1.4	µg/g	ASTM D3683 (Mod)
Chromium, Cr	41	µg/g	ASTM D3683 (Mod)
Lead, Pb	21	µg/g	ASTM D3683 (Mod)
Manganese, Mn	273	µg/g	ASTM D3683 (Mod)
Nickel, Ni	43	µg/g	ASTM D3683 (Mod)
Selenium, Se	<1	µg/g	ASTM D3683
Zinc, Zn	115	µg/g	ASTM D3683 (Mod)

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