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AIR PROTECTION BRANCH

September 15, 2011

Mr. Wei-Wei Qui  
Georgia Environmental Protection Division  
Air Protection Branch  
4244 International Parkway, Suite 120  
Atlanta, Georgia 30354

RE: *PyraMax Ceramics, LLC – Wrens, Georgia – Application No. 20584  
Volume I and Volume II (Modeling) PSD Permit Application*

Dear Mr. Qui:

Trinity Consultants (Trinity), on behalf of our client PyraMax Ceramics, LLC (PyraMax), is providing written responses to questions received regarding Application No. 20584. The following is a summary of the question received, and our response.

1. Forms 3.00 of the application indicated that the flue gas temperature at the inlet of kiln baghouse BHK, 1 & 2 would be 258F, which is below the typical operating range of 350F - 700F for the "Catalytic Baghouse" control system marketed by Tri-Mer. Would this affect performance of the system regarding to NOx control?

As you may have noted from the Form 3.00 that you reference, the same temperature was incorrectly listed for both the baghouse (Tri-Mer) inlet and outlet temperature. The temperatures indicated (258F) are actually the stack exhaust temperature. This can be confirmed through review of both Form 7.00 and documentation provided in Volume II of the application (modeling), which list 258F as the kiln stack exhaust temperature. Therefore, the temperatures you reference listed on this form would not be the actual inlet temperatures to the Tri-Mer system. Based on data provided from the engineering team working on the design of the facility, the inlet temperature to the Tri-Mer system would be in the optimal operating range of the system (350-700F).

2. The process & instrumentation diagram prepared by Tri-Mer and provided by you on 08/24, 2011 indicated that the kiln stack exit would be equipped by NOx & SO<sub>2</sub> CEMS. Please confirm this will be monitoring scheme to be used at this facility.

As indicated in the e-mail from Tri-Mer which I provided with the referenced documentation, the drawings provided were not specific to the PyraMax system design. Please refer to the BACT analysis in Section 5 of Volume I of the application for a discussion of the proposed monitoring scheme for facility sources. There is also a summary table on Page 5-10 of the application which summarizes the proposed BACT emission limits and monitoring scheme. The current proposal does not include the use of NOx or SO<sub>2</sub> CEMS on the kiln exhaust stacks, but rather periodic stack testing for ongoing compliance purposes.

3. It seems that the Title of Section 5.23 should be "Emergency Generator PM/PM10/PM2.5 BACT".

You are correct. The current title for this section is a typo.

4. Are the emission limits proposed as Best Available Control Technology (BACT) in Section 5 of Volume I of the application representative of emissions from each kiln, or both kilns combined?

All emission limits proposed as either BACT or Maximum Achievable Control Technology (MACT) are representative of the proposed emission limit for each individual source at the facility unless specifically noted otherwise. For example, when referring to Table 5-1 (Selected BACT Summary) of Volume I of the application, the proposed NOx BACT emissions limit of 36.3 lb/hr is for each kiln (i.e. a limit of 36.3 lb/hr for Kiln 1, and a limit of 36.3 lb/hr for Kiln 2). This can be confirmed through review of the calculations (Table C-2 and C-9) and emission rate information used for modeling in Volume II of the application.

5. How do the Carbo Ceramics Toomsboro Plant kilns compare to the PyraMax Ceramics facility kilns? Please provide an explanation for any differences noted.

The following are summary tables of the key parameter information of interest and emissions information for both the Carbo Ceramics Toomsboro Plant kilns and the PyraMax facility kilns.<sup>1</sup>

**Table 1: Comparison of Kiln Parameters (Each Kiln) For Carbo Ceramics, Toomsboro and PyraMax Ceramics – Kings Mill Facility**

Facility	Kiln Material Feed Input (ton/hr)	Kiln Heat Input (MMBtu/hr)	Fuel to Kiln Input Ratio (MMBtu/ton)	Kiln Stack Exhaust (dscfm)	Stack Exhaust to Kiln Input Ratio (dscfm/ton of kiln input)
Carbo Ceramics	20.9	60	2.87	36,000	1722
PyraMax	23.3	49.3	2.16	40,434	1735

**Table 2: Comparison of Kiln Emissions (Each Kiln) For Carbo Ceramics, Toomsboro and PyraMax Ceramics – Kings Mill Facility**

Facility	Uncontrolled CO, lbs/hr (lb/ton kiln input)	Uncontrolled NOx, lbs/hr (lb/ton kiln input)	Uncontrolled SO <sub>2</sub> , lbs/hr (lb/ton kiln input)	Controlled PM/PM <sub>10</sub> /PM <sub>2.5</sub> , lbs/hr (lb/ton kiln input)
Carbo Ceramics	24.7 ASD (1.18)	121 ASD (5.79)	34.25 (1.64)	3.09/3.09/NA (0.148/0.148/NA)
PyraMax	51.4 (2.21)	181.5 (7.8)	116.4 (4.99)	8.53/8.53/6.98 (0.366/0.366/0.30)

Here is an explanation of the variables provided for the PyraMax facility kilns.

- a. Kiln Material Feed Input Rate – The kiln material feed input rate is based on design information provided by the design engineering company associated with the project.

<sup>1</sup> Information regarding the kilns for the Carbo Ceramics Toomsboro Plant provided via e-mail from Wei-Wei Qui of the Georgia EPD to Justin Fickas of Trinity Consultants, Inc. on September 6, 2011.

- b. Kiln Heat Input Rate – The kiln heat input rate is also based upon information provided by the kiln vendor. This value is under study by the kiln vendor to provide the optimal heat and mass balance design for the vendor. The data provided is the current best available data for the system.
- c. Kiln System Exhaust – The kiln system exhaust flow (dscfm) is based upon information provided by the design engineering company working on the engineering design for the project. These are kiln systems that may be provided by a different supplier than Carbo Ceramics kilns. Although the two processes are similar it would not be logical to assume that they would be identical regarding system air flows.
- d. Uncontrolled CO Emissions – The uncontrolled CO emissions are higher than those for the Carbo Toombsboro facility, both on a lb/hr and lb/ton basis. CO emissions were based primarily upon an emission factor from AP-42 for a natural gas rotary kiln, 11.17-6, as referenced for Table C-8 of the application. This value was utilized due to the lack of extensive data found available representative of the proposed kilns at PyraMax. This limit was proposed based on the best available data. If EPD has additional information available regarding the appropriate CO emissions from this type of source, PyraMax will review it.
- e. Uncontrolled NOx Emissions – The uncontrolled NOx emissions estimate for the PyraMax kilns is an engineering estimate following discussions with kiln vendors regarding the uncontrolled emissions from this type of source, and review of permitting documentation for the Carbo Ceramics Toombsboro facility. The uncontrolled NOx emissions are approximately 35% higher than those for the Carbo Ceramics Toombsboro kilns on a lb/ton basis. However, such variability could be expected dependent upon the actual design of the kiln system. As discussed with respect to the kiln exhaust flow rate, these kilns, although similar, will not be “identical” to the kilns at Carbo Ceramics, and it would not be unexpected that additional thermal NOx generation may result.

The most important item to note is that NOx emissions from the PyraMax facility will be controlled by an add-on control device, the catalytic baghouse system (Tri-Mer). The PyraMax proposed BACT emission limit for NOx emissions, 36.3 lb/hr per kiln, is representative of an 80% control of the estimated uncontrolled NOx emissions from each PyraMax kiln. The current proposed BACT emission limit for NOx emissions for each PyraMax kiln is 70% lower than the permitted BACT NOx emission limits for each kiln at the Carbo Ceramics Toombsboro facility.

- f. Uncontrolled SO<sub>2</sub> Emissions – The uncontrolled facility SO<sub>2</sub> emissions for the PyraMax kilns, 4.99 lb/ton, is based upon a mass balance of the expected raw material sulfur content to be utilized in the PyraMax facility kilns. Variability in raw material sulfur content for this type of process is not unexpected. Any differences in raw material sulfur content would explain differences between the PyraMax application and information contained within the Carbo Ceramics Toombsboro facility permit. This is not inconsistent with submittals put forward by Carbo Ceramics. In May 2010 the Carbo Ceramics McIntyre facility submitted application documentation for installation of a wet scrubber on one of the facility kilns in order to have operational flexibility in use of higher sulfur content raw materials. Also, the recent application by Carbo Ceramics for the Millen, Georgia facility is estimating over 3,000 tpy uncontrolled SO<sub>2</sub> emissions per kiln, for kilns reportedly very similar to those at the Toombsboro facility which have uncontrolled SO<sub>2</sub> emissions estimates of 150 ton/yr. These differences within the Carbo Ceramics facilities regarding uncontrolled SO<sub>2</sub> emission rates demonstrate how there could be differences between PyraMax and Carbo Ceramics for SO<sub>2</sub>.

- g. Uncontrolled PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions -- The first item to note is that, per our evaluation and understanding of the Carbo Ceramics Toombsboro permit, the BACT limit for the kiln is 0.01 gr/dscf and is representative of filterable PM emissions only. On Page 37 of the October 2009 preliminary determination document for the Carbo Ceramics Toombsboro facility, the following statement is made;

*While a noticeable detached plume on the calciner/kiln stack suggests some amount of condensable PM, 40 CFR 52.166 (amended 5/16/08) specifies that PM limits issued prior to January 1, 2011 need not account for these (i.e, only account for filterable PM).*

Condition 3.3.3(b) of the Carbo Ceramics Toombsboro Permit No. 3295-319-0029-V-02-1 states the following;

*Method 201 or 201A in conjunction with Method 202 shall be used to demonstrate compliance with the PM<sub>10</sub> emission limits during the performance testing. As an alternative to the PM<sub>10</sub> testing, the Permittee may assume that 100% of the PM emissions from the baghouses as determined via Method 5 are PM<sub>10</sub> in the emission compliance demonstration.*

Therefore, if the Carbo Toombsboro site limits are based on filterable PM only, the difference in the PM emissions between the two facilities is a function of the higher airflow contributing to a higher amount of filterable PM emissions (higher air flow with same gr/dscf emission rate will yield higher filterable PM emissions) for the PyraMax site, as well as the estimated PM emissions for the PyraMax kilns including an additional estimated condensable component. Please refer to Table C-8 and C-9 of the application for an explanation of the derivation of the condensable PM emissions estimate, and Table C-4 for a derivation of the filterable PM emissions for the PyraMax facility kilns.

If EPD has further information which they could share regarding the presence and magnitude of condensable emissions from the Carbo Ceramics Toombsboro facility kilns, then PyraMax would welcome receipt of such information and determine if revisions to their application would be required.

PyraMax and Trinity look forward to working with EPD on development of the draft permit for the proposed project. Please do not hesitate to contact me at (678) 441-9977 to review further questions or comments concerning this submittal.

Sincerely,

TRINITY CONSULTANTS

A handwritten signature in black ink, appearing to read "Justin Fickas", written over a horizontal line.

Justin Fickas, P.E.  
Managing Consultant

Enclosures

cc: Mr. Don Anschutz (PyraMax)  
Mr. Tom Muscenti (Trinity)  
Ms. Susan Jenkins (EPD)  
U.S. EPA Region 4