



October 21, 2011

Mr. Eric Cornwell
Georgia Environmental Protection Division
Air Protection Branch
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

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AIR PROTECTION BRANCH

RE: *PyraMax Ceramics, LLC – Wrens, Georgia – Application No. 20584
Volume I and Volume II (Modeling) PSD Permit Application
October 6, 2011 Technical Review Comments Response*

Dear Mr. Cornwell:

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

- Volume I: Dust Collector Flow Rates (Requested by DMU who needs some comfort from SSPP that the PM, PM10, and PM2.5 emissions are appropriate): Proposed particulate matter (PM), particulate matter less than 10 microns in diameter (PM10), and particulate matter less than 2.5 microns in diameter (PM2.5) are based on an outlet grain loading rate in grains per dry standard cubic feet (gr/dscf). Table C-4 provides the dust collector flow rates in dscf while the dust collector flow rates in the SIP Application (Appendix F) are listed in actual cubic feet per minute. Please provide a tabular comparison of these values using dscf and provide the calculations and variables used (moisture content, temp) to convert between these two units.*

Attachment A includes the requested table, which provides a side by side listing of the acfm and dscfm values for each of the facility dust collectors. For the most part, data regarding dscfm air flow rates was provided by the design engineering team for the facility. Instances where dscfm air flow rates were computed by Trinity has been noted in the requested table in Attachment A. Regarding emissions, there may be some confusion regarding the total PM emission rate computed for the facility kilns (Emission Point ID 14-12-1412, 24-12-1412). The total PM emission rate indicated for the kilns includes both a filterable and a condensable PM emission value, and was the only emission source for which a condensable PM emission rate was estimated. The value of 0.01 gr/dscf was evaluated as a filterable PM emission rate number, providing a filterable PM emission rate of 3.47 lb/hr (40,434 dscfm at 0.01 gr/dscf) as shown in Table C-4. This value was added to the condensable PM emission rate estimated for the kilns of 5.07 lb/hr as shown in Table C-9, to provide a lb/hr total PM emission rate estimate of 8.53 lb/hr (as shown in Table C-2). As discussed on page 5-27 of the application, the proposed compliance method for the kilns for total PM is stack testing per EPA Method 201/201A and Method 202.

It may also be noted that the reported dscfm, in some cases, is higher than the reported acfm value. In order to account for historical design iterations, for certain pieces of equipment, it was decided to base the PM emissions from the unit on the higher reported dscfm value, and base modeling on the lower reported range of the air flow rate. Taking this conservative route was decided upon to encompass the worst case range of conditions that would occur for these sources, as a higher

emission rate (high dscfm) and a lower stack velocity (lower acfm) will create a worst case modeling condition.

- 2. Volume I: Chapter 5 – Startup and Shutdown of Catalytic Baghouse: Please provide the time (in minutes) for which the calcining kilns will be operated uncontrolled while the catalytic baghouse is in startup mode. The 1-hr NO₂ emission rate during start-up will be reviewed against the modeling guidance for intermittent sources. The more critical item for that particular assessment would be an estimate of how often the process is in start-up mode, which may coincide, at least in part, with the replacement schedule of the ceramic filters. As an alternative, Pyramax can provide evidence that short-term NO_x emissions during startup and shutdown (when the catalyst is not fully effective) is still less than the BACT limit, on a lb/hr basis.*

The calcining kilns will not be operated uncontrolled during startup or shutdown. There is no effective startup time for the catalytic baghouse system, as there would be with Selective Catalytic Reduction (SCR) in certain types of processes. It would be expected that the system would be operating at peak efficiency within several minutes of startup. The system does have a bypass to prevent damage to the unit during process malfunctions. PyraMax will monitor the bypass to ensure it is closed during operation.

Also, there would be limited anticipated shutdown periods for the kiln. Any replacement schedule for the ceramic filters in the kiln could be accomplished while the kiln and catalytic baghouse system are in operation. The system is designed with multiple modules, with individual modules being isolated (to allow filter change out) without requiring shut down of the unit or reduction in operations.

- 3. Volume I: Chapter 5 – Calcining Kilns-CO Emissions: The applicant proposes the use of good combustion practices to minimize CO emissions from the calcining kilns. The applicant proposed a CO BACT limit of 2.21 lb CO/ton of material processed. The PSD CO BACT limit for the calcining kilns at CARBO Ceramics Toombsboro plant is 1.18 lb uncontrolled CO per ton of material processed. Georgia EPD is considering establishing a CO BACT limit for the proposed calcining kilns of 1.18 lb CO/ton of material processed. Please comment on this draft proposal for CO BACT from the calcining kilns.*

Research indicated a limited amount of public information available regarding CO emissions resultant from production of ceramic proppant materials. The CO emissions estimate for the kilns (and subsequent proposed BACT limit) was based on published values within AP-42 (Section 11.17-6, 2/98) for a gas fired rotary kiln from the lime manufacturing industry. The derivation of CO emissions from the kiln could be resultant from both combustion associated emissions (i.e. natural gas/propane) as well as CO formation resultant from the carbon content of the clay materials processed. This is evidenced by the fact that the emission rate from the Carbo Ceramics Toombsboro plant, at a rated kiln capacity of 20.9 ton/hr, would be approximately;

$$20.9 \text{ ton/hr} * 1.18 \text{ lb/ton} = 24.7 \text{ lb/hr}$$

At the indicated rated kiln capacity of the Carbo Ceramics Toombsboro kilns of 60 MMBtu/hr, assuming a natural gas heating capacity of 1,000 Btu/ft³ and AP-42, Section 1.4 for CO emissions from natural gas combustion of 84 lb/MMCF provides the following emission estimate;

$$60 \text{ MMBtu/hr} * 84 \text{ lb/MMCF} \div 1,000 \text{ Btu/ft}^3 = 5.04 \text{ lb/hr}$$

This would provide an emissions estimate only one quarter of the allowed emissions for the Carbo Ceramics Toomsboro facility. It is unclear to PyraMax how the Carbo Ceramics Toomsboro site CO emissions were derived, and design information for the Carbo Ceramics Toomsboro site regarding clay composition analysis is unknown (i.e. carbon content). The maximum carbon content from clay analysis data reviewed for the PyraMax facility is a carbon content of 0.36% (wt. %). It is unclear how differences in the clay carbon content between the Carbo Ceramics Toomsboro and PyraMax facilities would impact CO emissions. It is also unclear how NOx emissions control reduction measures being employed at the PyraMax facility would have an effect on CO emissions. Low NOx emissions technologies, including application of low NOx burner technology, are being implemented for the PyraMax facility kilns. PyraMax asks that Georgia EPD consider these issues in regards to reduction of the facility CO emissions limit.

4. *Volume I: Chapter 5 – Pelletizers – VOC Emissions* : The VOC BACT analysis should also include VOC emissions from the dispersant added to the clay slurry (i.e., evaporation of the dispersant impurities such as methanol and methyl acetate).

There may be some confusion regarding the origin of the methanol and methyl acetate emissions from the pelletizers. The origin of the VOC emissions is addition of an additive material as part of the feedstock preparation process. This additive material contains impurities, which when processed through the pelletizers leads to the release of VOC emissions in the form of methanol and methyl acetate.

The VOC emissions estimated from the pelletizers, as summarized in Table C-2 of the application, include VOC emissions from both combustion related VOC emissions, as well as VOC emissions resultant from use of the additive material. Combustion related VOC emissions from the pelletizers are tabulated in Table C-10 of the application. Additive emissions are summarized in Tables C-12 thru C-15 of the application. VOC combustion related emissions from Table C-10 for each pelletizer (0.82 lb/hr) and VOC emissions from each pelletizer due to use of the additive from Table C-15 (10.96 lb/hr) lead to the total VOC emissions estimate from each pelletizer of 11.78 lb/hr (Table C-2). The VOC BACT analysis in Section 5.14 of the application does account for these emissions. From the introduction to Section 5.14;

VOC from the pelletizer is generated as a result of natural gas combustion. Carbon in the fuel that is not oxidized completely results in VOC formation. The process also involves the addition of a material to the clay mixture process which contains a small amount of methanol and methyl acetate that is estimated to be emitted from the pelletizer process.

Use of an alternate additive material to reduce VOC emissions was also discussed (Page 5-41).

VOC emissions resultant from use of the additive materials are due to an impurity present within the material that is common to the raw material itself, and cannot be inherently avoided.

The additive material used is an inherent part of the process and cannot be easily replaced. Therefore, emissions of VOC resultant from use of the additive materials was addressed in the VOC BACT for the pelletizers, and was considered in the proposal for the BACT VOC emission limit for the pelletizers.

One issue regarding the additive materials, which was not extensively addressed within the application, were resultant VOC emissions (methanol, methyl acetate) from the additive material silo. At the time of submittal of the application, it was assumed that during silo loading activities there would be sufficient vapor pressure and air displacement to result in emissions of methanol and

methyl acetate. However, further discussions with the design team for the facility have indicated that system design (including the additive material delivery truck utilizing vapor recovery) have lead to the current understanding that there would no longer be any expected VOC emissions (methanol, methyl acetate) from material handling of the additive material.

5. Volume I: Appendix F: SIP Application Form 3.0 for APCD Unit ID BHK1,2: *The same temperature was incorrectly listed for both the baghouse (Tri-Mer) inlet and outlet temperature. Based on data provided by the applicant, in a letter to Georgia EPD dated September 15, 2011, the inlet temperature to the Tri-Mer system would be in the optimal operating range of the system (350-700 deg F). Please submit an updated SIP Application Form 3.0 for air pollution control device unit ID BHK1 & 2 with the applicable inlet and outlet temperatures.*

An updated SIP Application Form 3.00 has been included as Attachment B, which reflects the actual expected inlet system temperature.

6. Volume II: *Please provide documentation which clearly defines the facility boundary to separate the ambient air and property area, and shows the boundary receptor locations. A large (~ 36"x36") paper site plan (or .dxf file), to scale and showing a true North arrow, should be submitted with the application. The site plan should indicate the fenceline and fenceline-receptors, the boundary, sufficient coordinate and scale information to allow independent confirmation of the BPIP input building coordinates, the building heights should be identified on the plan, and buildings labeled as that in the BPIP file.*

Information as requested above was provided in Appendix A of Volume II, Figures A-3 and A-4. The only information which was not provided was a "large" printout version of the map at a 36" x 36" scale, or identifying the location of the fenceline receptors along the fenceline. Please find enclosed, in Attachment C, a revised Figure A-3 (including the location of fence line receptors) in both an 8.5" x 11" format, as well as a larger scale format, and Figure A-4 (as submitted in the application) in both an 8.5" x 11" format and a larger scale format. The level of detail provided in these drawings are consistent with what has accepted before as part of prior submittals. If there is additional information/formatting needed for the drawing please let me know.

7. Volume II: *A significant impact area (SIA) for the annual PM10 NAAQS should have been determined. If the SIA for the annual PM10 NAAQS is larger than the SIA for the 24-hour PM10, the off-site modeling Increment inventory may be incorrect. Please address this comment by identifying the size of the SIA for the annual PM10 Increment and adjusting the off-site Increment inventory as may be necessary.*

The 24-hr Significant Impact Area (SIA) for PM₁₀ was determined to be approximately 1.2 km, as shown on Page 5-3 of Volume II of the permit application. A significant impact area for annual PM₁₀ was determined, although it was not discussed within Volume II of the application. Annual PM₁₀ plot files were provided within Appendix E of the Volume II application (electronic modeling files) which can be used to derive the annual PM₁₀ SIA. A review of this documentation will show that the annual PM₁₀ SIA is approximately 0.49 km. Tables D-19 and D-20 of Appendix D of Volume II of the application provide the PM₁₀ derived emissions inventory for NAAQS, conservatively used in the PM₁₀ annual increment assessment. It is also important to note that the PM_{2.5} SIAs derived were larger for the 24-hr and annual averaging periods, and as discussed in Volume II of the application the PM_{2.5} SIAs were conservatively used in determination of emission inventories for both PM_{2.5} and PM₁₀.

Additionally, a review of the emissions inventory screening procedures indicates that the emissions inventory would not change when considering either the annual or 24-hr PM₁₀ SIA (or annual or 24-hr PM_{2.5} SIA). Both SIAs (24-hr, annual) are so small that they do not automatically include any sources within the inventory, as the closest PM₁₀ inventory source is over 4 km away (outside both SIAs). Even when considering the “long term D” aspect of the 20D analysis, the annual PM₁₀ SIA would also not require inclusion of any additional sources. This effectively means that use of the annual PM₁₀ SIA in any inventory development analysis, as opposed to the PM₁₀ or PM_{2.5} 24-hr SIA, would not result in selection of any additional sources to include in the dispersion modeling analysis for the increment evaluation.

8. *Volume II: The applicant should conduct, document, and submit an ozone impact analysis because the projected NOx emission and VOC emission are both greater than 100 tons per year. Please refer to Appendix A of this letter.*

An ozone impact analysis discussion was included on Page 3-5 of Volume II of the application. However, additional supplement data regarding an ozone ambient impact analysis is provided as part of this technical comments response.

There are no existing ozone monitors in Jefferson County, where the PyraMax site is proposed to be located. The three closest monitors to the proposed site are presented in the table below, along with the 3-year rolling average ozone concentration, which is used when comparing monitor results to determine attainment status. Please note that ozone monitor data for 2010 could not be located to be included as part of this assessment. Therefore, the most recent up to date data available (up to 2009) was included.

Table 1. Ozone Concentration at Three Nearest Monitors

Site Name	City	County	Distance to Facility (km)	3-Year Rolling Average (ppm) ¹		
				2005-2007	2006-2008	2007-2009
Bungalow Road Elementary School	Augusta	Richmond	44	0.081	0.080	0.074
Riverside Park	Evans	Columbia	50	0.074	0.074	0.071
Macon S.E. - Georgia Forestry Service	Macon	Bibb	117	0.080	0.078	0.076

1. Ozone concentration for each year 2005 through 2009 obtained from Georgia EPD's Ambient Air Surveillance Report, Appendix A, Ozone 8-Hour Average 4th Max value for each respective year. The 3-year rolling average reports the average of the 3 years indicated.

Ozone is formed when nitrogen oxides (NO_x) and volatile organic compounds (VOC) react in the presence of sunlight. In Georgia, this reaction is NO_x limited due to the presence of high amounts of biogenic VOC. NO_x primarily is emitted from mobile sources and industrial sources. Therefore, ozone formation is directly impacted by NO_x emissions, which is a reflection of population density, vehicle miles travelled (VMT), and industrial NO_x emissions.

Jefferson County has a much lower population density, NO_x density, and VMT than Richmond, Columbia, and Bibb counties. In order to indicate this graphically, the following figure compares these parameters for the three closest monitors and Jefferson County with and without the proposed PyraMax facility. As seen from the figure, of the three monitor locations, Columbia County has the lowest population density, VMT, and NO_x density, and consequently has the lowest monitored ozone concentration, 71 ppb, for 2007 - 2009. Going by the same pattern, Jefferson County has an even lower population density, VMT, and NO_x density and accordingly is expected to have a lower ozone concentration and would therefore be in attainment with the 8-hour ozone standard of 75 ppb. Also, as indicated in the figure below, Jefferson County with the proposed PyraMax facility would still

have NO_x emissions below the levels in any of the three closest counties with monitor locations, and hence is not expected to have a significant impact on the ozone attainment status in Jefferson County. Please note that, in Figure 1, the Jefferson County with PyraMax estimates include an increase in NO_x emissions only, as VMT and population density would not be expected to change significantly as a result of the facility. VMT and population density would most certainly not increase by a significant enough amount to approach the levels seen in Columbia County.

Table 2. Urbanization Data for Counties of Interest

Monitor County	Population Density ^{1,2} (people/mile ²)	VMT/Day ^{1,3} (10,000 miles/day)	NO _x Density ^{4,5} (tpy/mile ²)
Richmond	616.5	512.3	43.76
Columbia	307.9	255.8	13.34
Bibb	615.6	573.1	38.76
Jefferson	33	70.8	3.58
Jefferson with PyraMax ⁶	33	70.8	4.25

1. Population density and VMT/day values for Richmond, Columbia and Bibb obtained from "Nonattainment Area Designations for Georgia Under the 2008 Revised 8-hour Ozone National Ambient Air Quality Standard Technical Analysis".

2. Population density of Jefferson County obtained from Jefferson County website: <http://jeffersoncounty.georgia.gov>

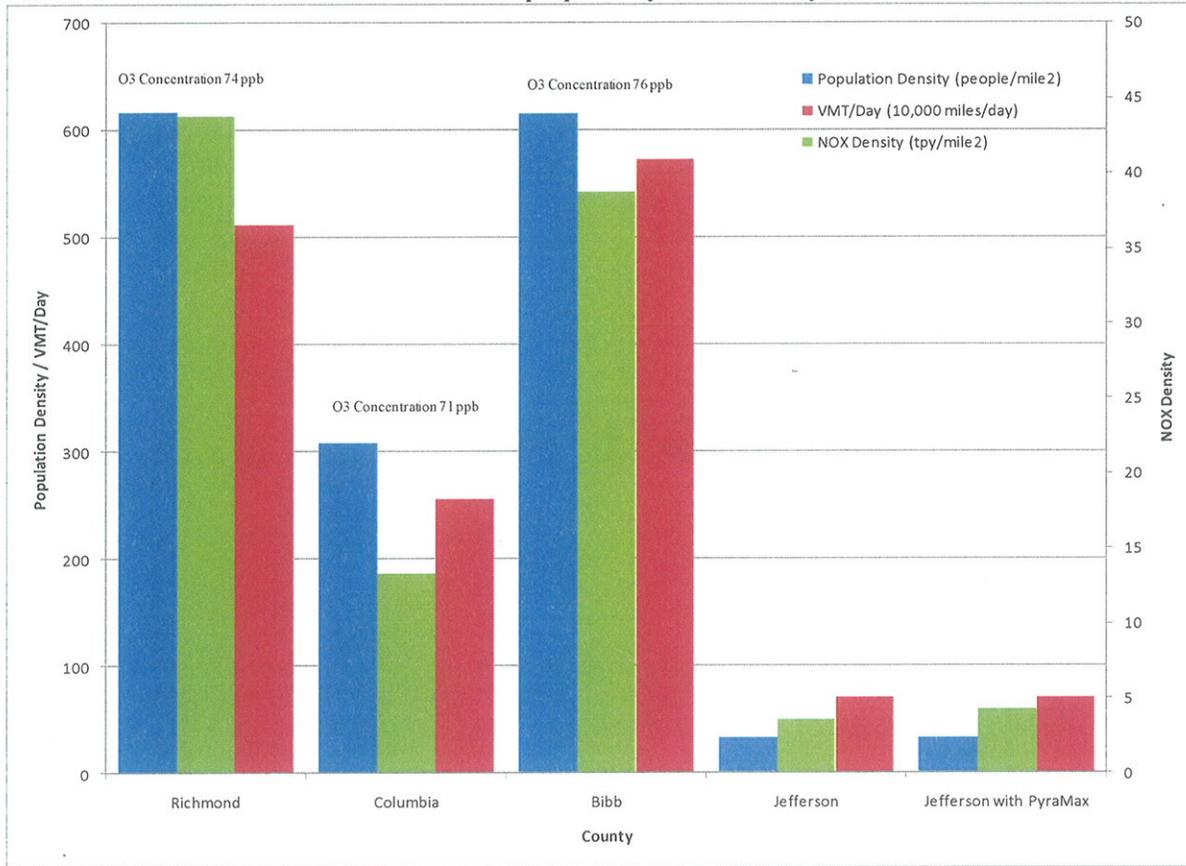
3. VMT/Day for Jefferson County obtained from the Georgia Department of Transportation website, Office of Transportation Data, for Jefferson County for 2008: http://www.dot.state.ga.us/statistics/roaddata/documents/445/dpp445_2008.pdf

4. NO_x density calculated using NO_x emissions in "Nonattainment Area Designations for Georgia Under the 2008 Revised 8-hour Ozone National Ambient Air Quality Standard Technical Analysis" for Richmond, Columbia and Bibb counties and county area per the county's website.

5. Jefferson County NO_x density calculated using NO_x emissions from 2005 NEI data including stationary and mobile source and county area per the county's website.

6. NO_x density for Jefferson County with PyraMax was calculated by summing potential emissions of NO_x from PyraMax to the 2005 NEI data. Population density and VMT/Day are assumed to remain unchanged.

Figure 1. Urbanization Evaluation of Nearest Counties with Ozone Monitors vs. Jefferson County with and without the proposed PyraMax Facility



9. *Volume II: Chapter 5* Please prepare a table for submission that compares the maximum modeling concentration and the applicable Class I significant impact levels. This table should include a PM_{2.5} impacts comparison against the Class I PM_{2.5} SILs as these became effective on 12/20/10, independently of the PM_{2.5} Increments.

The requested table was provided on Page 3-12 (Table 3-4) of Volume II of the application and is provided below.

TABLE 3-4. RESULTS OF CLASS I SCREENING ANALYSIS

Pollutant	Averaging Period	Modeled Concentration (µg/m ³)	SIL (µg/m ³)	Exceeds SIL? (Yes/No)
SO ₂	3-Hr	0.308	1.00	No
	24-Hr	0.104	0.20	No
	Annual	0.006	0.08	No
PM ₁₀	24-Hr	0.180	0.32	No
	Annual	0.013	0.20	No
NO ₂	Annual	0.018	0.1	No

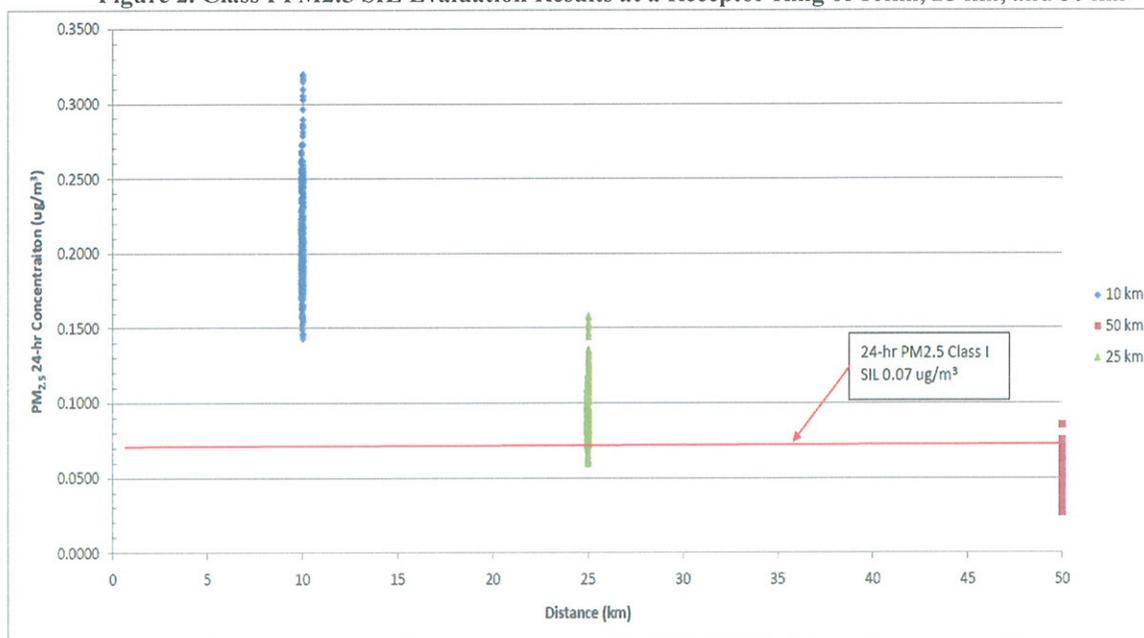
As can be seen from the provided table, no exceedances of the Class I SILs were reported. However, a PM_{2.5} impacts comparison, against the PM_{2.5} SILs, was not provided. A model run was conducted to assess a receptor ring at a distance of 10 km, 25 km, and 50 km from the PyraMax facility. All modeling assumptions, setup, emission rates, etc. used in the model were those provided in Volume II of the permit application. A graphical representation of the 50 km receptor ring, and the corresponding approximate location of the Class I areas of interest, has been provided in Attachment D, along with a CD containing the electronic modeling files for the PM_{2.5} Class I SIL runs with AERMOD. It is worth mentioning that the figure demonstrates that the impacts predicted over the SIL are not in the direct path of the Class I areas of interest.

At the 50 km receptor ring, the maximum annual result for PM_{2.5} was found to be 0.0078 µg/m³, well below the PM_{2.5} Class I annual SIL of 0.07 µg/m³. The PM_{2.5} 24-hr maximum impact, which was derived as the 5-yr average maximum 24-hr concentrations at each receptor at the 50 km ring, was found to be approximately 0.086 µg/m³, over the 24-hr PM_{2.5} derived SIL of 0.06 µg/m³. However, it is not believed that any increment analysis of any Class I areas is warranted by these results.

The closest Class I area to the PyraMax facility is Wolf Island, which is approximately 222 km from the facility. At this distance it is highly unlikely that source concentrations would persist at 4 times the distance at which a level of only approximately 40% greater than the standard were predicted.

To provide further support that continued modeling for this issue is not warranted, a model was run at a receptor ring distance of both 10 km and 25 km. A scatter plot of the 24-hr average results for PM_{2.5} at those distances is shown in Figure 2 below.

Figure 2. Class I PM_{2.5} SIL Evaluation Results at a Receptor Ring of 10km, 25 km, and 50 km



As can be seen from this data scatter plot, there is a definitive drop off in predicted modeled concentrations with distance. With the rate of decline seen in concentrations in distance it is unlikely that concentrations above the 24-hr PM_{2.5} Class I SIL would persist much past a distance of 50 km.

10. Volume II: Appendix D:

- a. *The modeling data for all off-site sources included in the cumulative modeling analysis (D-2 ~ D-12, D-14 ~ D-18, D21-D27) should have references regarding the data sources, i.e., stack characteristics and emission derivation.*

A document providing an explanation of the derivation of the modeled source parameters is included in Attachment E.

- b. *KaMin Wrens – Main: the NOx emissions (g/s) in Table D-3 is about 10 times larger than that in the modeling input files. Please verify the correct emission rate value.*

We have confirmed that the modeled input emission rates were correct. Values were incorrectly shown in Table D-3 due to a spreadsheet linking error. The electronic copy of the inventory tables has corrected this error.

- c. *KaMin Wrens-Main: Please clarify what is Stack ID-GG1S in Table D-3 and include an explanation on the derivation of its potential emission and stack characteristics.*

Stack ID-GG1S is a singular combined stack for five permitted plant generators. These generators are listed in the permit for the facility (Permit No. 3295-163-0016-V-04-0) as sources W1, W2, W3, S-101, and S-103. The generators are discussed in permit documentation as being both emergency and peaking units, which would presumably preclude them from exclusion from the modeling assessment. Several of these generators are located at a mine site (off the KaMin Wrens site). The emission rate used is the total short term NOx emission rate as derived for those emission units from permit application documentation for the site, based on site specific test data (excluding a 15% safety factor that was discussed in use for permitting purposes). Stack data for the site (including location) is based on publicly available information as provided in data submitted for the NEI. Although it is unlikely that all five generators share a common stack (given that some are in an unknown off site location), the data provided in the NEI is the best information which was found available for modeling of these emission units, and is consistent with how the source was modeled in the past as part of other PSD modeling applications.

- d. *Please submit an electronic copy of the off-site inventory (D-1 ~ D-26) in Excel format.*

An excel spreadsheet containing the requested tables has been included on the CD enclosed in Attachment D.

11. *The air impact assessment (modeling) did not model fugitive emissions. Although it is not EPD's intent to require modeling of paved roads, this does not carry forward automatically to all other fugitive dust sources. Please provide a justification as to why fugitive emissions were not modeled. Specifically, please document the extent and emissions from fugitive sources such as unpaved roads, open stockpiles, etc.*

At the PyraMax facility there are no plans for any unpaved roadways. All truck traffic will occur on either asphalt or concrete paved roadways. Therefore, it is not expected that there would be any unpaved road emissions associated with the PyraMax facility. Also, there will be no open stockpiles, etc. at the site from which fugitive emissions would be expected to occur. Any raw material (clay) handling and storage areas will be enclosed. The main clay inlet storage area is a enclosed building on three sides (with a roof). The inlet clay material also has a very high moisture content (approximately 20%). It is unlikely that any significant fugitive emissions would occur from these storage areas.

12. *The application did not address any growth emissions from increased kaolin clay sales from local contract clay mines. Please provide a list (including location and distance to PyraMax) of the clay mines that may sell to PyraMax. Also, please provide an assessment of growth emissions due to increased clay sales.*

There are two mine sites that are currently under consideration. One of the sites is in South Carolina approximately 85 km from the site in Aiken County (441,818 m E, 3,720,087 m N, Zone 17), and the other is in Jefferson County approximately 19 km southwest of the facility (355,455 m E, 3,661,745 m N, Zone 17). These distances from the PyraMax site put it outside of the SIA determined for all pollutants as part of the Class II modeling analysis. The site in Georgia will not be connected to the PyraMax facility via any pipeline or other material conveyance method. The site in Georgia is not an existing mine site and is being developed by a company external to PyraMax.

There would not be expected to be any significant growth within either Jefferson County or Aiken County as part of mining activities. Additional growth beyond the site mining activities would not be expected as there is existing infrastructure at both of the potential mine site locations.

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



Justin Fickas, P.E.
Managing Consultant

Enclosures

cc: Don Anschutz (PyraMax)
Tom Muscenti (Trinity)
Susan Jenkins (EPD)
Wei-Wei Qui (EPD)
Yan Huang (EPD)
U.S. EPA Region 4

Attachment A – Facility Dust Collector Flow Information

Table 1. Dust Collector Flowrates

Process Area	Dust Collector ID	Dust Collector Description	Flow Rate (dscfm)	Flow Rate (acfm)
Pelletization - Line 1	12-12-1163	Feed Bin Vent Filter ¹	54	125
	12-12-1170	Baghouse- for dust from kiln baghouse to Feed Bin ¹	750	722
		Additive silo bin vent ¹	500	500
Pelletization - Line 2	12-12-1141	Baghouse for pelletizer ²	89,820	103,653
	22-12-1163	Feed Bin Vent Filter ¹	54	125
	22-12-1170	Baghouse- for dust from kiln baghouse to Feed Bin ¹	750	722
Green Screening - Line 1	22-12-1141	Baghouse for pelletizer ²	89,820	103,653
	13-12-1215	Baghouse for Green Pellet Screening ¹	7,488	6,807
	13-12-1224	Baghouse for Dry Milling ¹	18	
Green Screening - Line 2	23-12-1215	Baghouse for Green Pellet Screening ¹	7,488	6,807
	23-12-1224	Baghouse for Dry Milling ¹	18	
Calcining and Sintering - Line 1	14-12-1486	Kiln Recycle Feed Bin Vent Filter ¹	242	220
	14-12-1412	Kiln Baghouse ¹	40,434	54,777
Calcining and Sintering - Line 2	24-12-1486	Kiln Recycle Feed Bin Vent Filter	242	220
	24-12-1412	Kiln Baghouse	40,434	54,777
Product Screening - Line 1	15-12-1488	Baghouse for Final Product Screening and QC ¹	8,653	7,866
Product Screening - Line 2	25-12-1488	Baghouse for Final Product Screening and QC ¹	8,653	7,866
Shipping - Line 1	16-12-1521	Silo #1 Bin Vent Filter ¹	240	220
	16-12-1531	Silo #2 Bin Vent Filter ¹	240	220
	16-12-1541	Silo #3 Bin Vent Filter ¹	240	220
	16-12-1551	Silo #4 Bin Vent Filter ¹	240	220
	16-12-1561	Silo #5 Bin Vent Filter ¹	240	220
	16-12-1573	Weigh Bin Vent Filter ¹	40	39
	16-12-1580	Baghouse for Loading Operations ¹	16,096	14,633
Shipping - Line 2	26-12-1521	Silo #1 Bin Vent Filter ¹	240	220
	26-12-1531	Silo #2 Bin Vent Filter ¹	240	220
	26-12-1541	Silo #3 Bin Vent Filter ¹	240	220
	26-12-1551	Silo #4 Bin Vent Filter ¹	240	220
	26-12-1561	Silo #5 Bin Vent Filter ¹	240	220
	26-12-1573	Weigh Bin Vent Filter	40	39
	26-12-1580	Baghouse for Loading Operations ¹	16,096	14,633
Control System - Line 1		Sodium bicarbonate silo bin vent filter ¹	500	500
		Fly Ash Silo bin vent filter ¹	2,000	2,000
Control System - Line 2		Sodium bicarbonate silo bin vent filter ¹	500	500
		Fly Ash Silo bin vent filter ¹	2,000	2,000

1. Flowrate in dscfm and acfm provided by Design Engineering Team, SS0E.

2. Flowrate in dscfm obtained from acfm with actual temperature of 200 F.

Attachment B – Updated SIP Form 3.0

Facility Name: PyraMax Ceramics, LLC

Date of Application: Updated October 2011

Form 3.00 – AIR POLLUTION CONTROL DEVICES - PART A: GENERAL EQUIPMENT INFORMATION

APCD Unit ID	Emission Unit ID	APCD Type (Baghouse, ESP, Scrubber etc)	Date Installed	Make & Model Number (Attach Mfg. Specifications & Literature)	Unit Modified from Mfg Specifications?	Gas Temp. °F		Inlet Gas Flow Rate (acfm)
						Inlet	Outlet	
BV11,21	KRF1,2	Bin Vent Filter	June 2012	TBD	N/A	68	68	220
BHK1,2	KLN1,2	Baghouse	June 2012	TBD	N/A	650	258	54,777
	KC1,2							
	GRZ1,2							
	CE1,2							
BHF1,2	FS11,21	Baghouse	June 2012	TBD	N/A	68	68	7,866
	FS12,22							
	FS13,23							
	FS14,24							
	RB11,21							
	RB12,22							
RE1,2								
BV12,22	S11,21	Bin Vent Filter	June 2012	TBD	N/A	68	68	220
BV13,23	S12,22	Bin Vent Filter	June 2012	TBD	N/A	68	68	220
BV14,24	S13,23	Bin Vent Filter	June 2012	TBD	N/A	68	68	220
BV15,25	S14,24	Bin Vent Filter	June 2012	TBD	N/A	68	68	220
BV16,26	S15,25	Bin Vent Filter	June 2012	TBD	N/A	68	68	220

Facility Name: PyraMax Ceramics, LLC

Date of Application: July 2011

Form 3.00 – AIR POLLUTION CONTROL DEVICES – PART B: EMISSION INFORMATION

APCD Unit ID	Pollutants Controlled	Percent Control Efficiency		Inlet Stream To APCD		Exit Stream From APCD		Pressure Drop Across Unit (Inches of water)
		Design	Actual	lb/hr	Method of Determination	lb/hr	Method of Determination	
BHK1,2	PM, PM10	99%	99%	853	Eng. estimate	8.53	Eng. estimate	2-10
	PM2.5	99%	99%	698	Eng. estimate	6.93	Eng. estimate	
	SO2	90%	90%	116	Eng. estimate	11.5	Eng. estimate	
	NOX	80%	80%	181.5	Eng. estimate	36.3	Eng. estimate	
BHF1,2	PM, PM10	99%	99%	37.1	Eng. estimate	0.371	Eng. estimate	2-10
	PM2.5	99%	99%	19.5	Eng. estimate	0.195	Eng. estimate	
BV12,22	PM, PM10	99%	99%	1.03	Eng. estimate	1.03x10 ⁻²	Eng. estimate	2-10
	PM2.5	99%	99%	0.541	Eng. estimate	5.41x10 ⁻³	Eng. estimate	
BV13,23	PM, PM10	99%	99%	1.03	Eng. estimate	1.03x10 ⁻²	Eng. estimate	2-10
	PM2.5	99%	99%	0.541	Eng. estimate	5.41x10 ⁻³	Eng. estimate	
BV14,24	PM, PM10	99%	99%	1.03	Eng. estimate	1.03x10 ⁻²	Eng. estimate	2-10
	PM2.5	99%	99%	0.541	Eng. estimate	5.41x10 ⁻³	Eng. estimate	
BV15,25	PM, PM10	99%	99%	1.03	Eng. estimate	1.03x10 ⁻²	Eng. estimate	2-10
	PM2.5	99%	99%	0.541	Eng. estimate	5.41x10 ⁻³	Eng. estimate	
BV16,26	PM, PM10	99%	99%	1.03	Eng. estimate	1.03x10 ⁻²	Eng. estimate	2-10
	PM2.5	99%	99%	0.541	Eng. estimate	5.41x10 ⁻³	Eng. estimate	