

South Carolina

Department of Health and Environmental Control

Bureau of Air Quality

Final Determination and Notice of MACT Approval

For

PyraMax Ceramics, LLC
Allendale, South Carolina

February 8, 2012

PyraMax Ceramics, LLC
Allendale County, South Carolina

Final Determination and Notice of MACT Approval

This review was performed by the Bureau of Air Quality of the South Carolina Department of Health and Environmental Control in accordance with South Carolina Regulations for the Prevention of Significant Air Quality Deterioration.

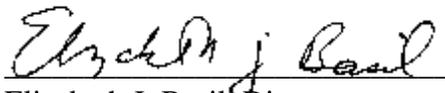
February 8, 2012

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PyraMax Ceramics, LLC
Allendale County, South Carolina

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I. Time Line (Permitting Action History)

- 9/16/2011 The South Carolina Department of Health and Environmental Control (SC DHEC), Bureau of Air Quality (BAQ), received a Prevention of Significant Deterioration (PSD) Construction Permit application from PyraMax Ceramics, LLC, Inc. under the Expedited Review Program.
- 9/22/2011 G. Robinson advised Tom Muscenti of Trinity Consultants that the BAQ could accept the PSD Construction Permit application for expedited review. On this same date, Mr. Muscenti advised that the facility still wished to pursue the Expedited review process.
- On this date G. Robinson verbally requested that Mr. Muscenti provide the spreadsheets that were used to develop the individual source emissions. The pages provided in the application listed the individual emission rates, but provided no insight into how the rate was established.
- 9/26/2011 By E mail and telephone conversation with T. Muscenti, a date was selected for a meeting at DHEC to review the PSD application and to cover any preliminary questions concerning the application. The meeting will include representatives from the facility, the consulting firm, the Dept of Commerce, and BAQ Permitting and Modeling. The meeting is scheduled for October 11, 2011, 9 AM until 12 noon.
- 10/3/2011 G. Robinson sent an E mail requesting that the consultant provide the spreadsheets used to calculate the individual source emissions. This request had been made verbally on 9/22/2011.
- 10/4/2011 Sent PSD Application Not Deemed Complete letters to EPA, USFWS, and USFS.
- 10/10/2011 Received Emission calculation spreadsheets from T. Muscenti, Trinity Consultants.
- 10/11/2011 Sent PSD Application Deemed Complete letters to EPA, USFWS, and USFS.
- 10/11/2011 Held a meeting in DHEC headquarters concerning the PSD application. Subjects concerning the proposed facility in general and the specific BACT analysis were discussed. Those in attendance: PyraMax Ceramics LLC – Don Anschutz, Michael Burgess, Richard Derbawka, & Michael Simon; Trinity Consultants – Tom Muscenti; SSOE Group – Anna Koperczak; BAQ – Elizabeth Basil, Steve McCaslin, John Glass, Veronica Gorman, Reba Glymph-Fant, & George Robinson.
- 10/17/2011 Sent an Action Pending list to Tom Muscenti and Richard Derbawka via E mail. The document contained a list of questions and items requiring further action as a result of a preliminary review of the PyraMax PSD application by BAQ personnel. Most of

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these items were discussed during the joint meeting with PyraMax on October 11, 2011.

- 10/20/2011 Received the initial response from Trinity Consultants related to the Action Pending list. This response was a partial response to the list.
- 10/31/2011 Received a letter from EPA, Region 4, dated October 26, 2011. The Region 4 office stated in this letter that they did not have any significant comments concerning the permit application. The letter did include observations concerning proposed control devices and proposed BACT.
- 11/02/2011 Sent additional questions to Tom Muscenti and Richard Derbawka via E mail related to the BACT determination and analysis concerning the NO_x and PM.
- Received a group of attachments from Trinity Consultants addressing: Response to DHEC Action Pending questions, Sulfur emissions, SC Mine samples, Updated process flow charts, Heater emission calculations, CARBO EPA comments, PyraMax EPA comments, GA Mine samples, Manufacturer data on crossfire burners for kiln.
- 11/03/2011 Sent to Tom Muscenti and Richard Derbawka via E mail an initial set of questions / comments concerning the cost analysis.
- 11/08/2011 Received an E mail from Trinity Consultants with two attachments addressing: PM BACT questions and NO_x BACT questions.
- 11/15/2011 Received an E mail from Trinity Consultants with five attachments. Four of the attachments provided updated BACT Cost tables. The fifth attachment concerned responses to initial BACT Cost Evaluation Questions / Comments from DHEC.
- 11/15/2011 Sent to Tom Muscenti and Richard Derbawka via E mail a detailed list of questions and comments related to BACT Costs Analysis.
- 11/16/2011 The Modeling Section sent to Jonathan Hill of Trinity Consultants an E mail concerning modeling information still required.
- 11/16/2011 Received from Trinity Consultants an updated Excel document with source emission calculations.
- 11/17/2011 Sent E mail to Tom Muscenti requesting additional information and justification in regards to the BACT CO emission limit proposed in the permit application. Also requested more information on the VOC emissions from additives and whether alternatives additives with lower VOC emissions may be available.
- 11/28/2011 Received an E mail with attachments from Trinity Consultants. The reply addressed the DHEC questions concerning the BACT CO emission limit and the question of

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alternative additives. The reply also addressed an earlier question concerning a Control Plan to control fugitive dust emissions.

- 11/29/2011 Sent E mail to Tom Muscenti, requesting further explanation on the application and cost of flue gas recirculation in regards to boilers, calcine kilns, and pelletizers.
- 11/29/2011 Telephone conference call with participants: Richard Derbawka, Tom Muscenti, Elizabeth Basil Steve McCaslin, and George Robinson. The conference addressed the time line for the draft permit, the public notice comment period, and the public meeting. Also discussed was the need for better calculation and justification of the BACT CO emission limit. DHEC advised that the Modeling Section was still waiting for responses to questions concerning compliance modeling.
- 11/30/2011 Received an E mail with attachments from Trinity Consultants. The reply addressed the potential use of flue gas recirculation. The reply separately addressed the kilns, pelletizers, and boilers.
- 12/15/2011 The BAQ placed the PSD Preliminary Determination and PSD Construction Permit No. 0160-0023-CA on public notice by publication in *The Allendale Sun* newspaper in Allendale, South Carolina. All appropriate Federal and State Officials were notified.
- 01/19/2012 DHEC, BAQ held a Question and Answer session from 6:30 – 7:30 PM at the Brandt Agricultural Building located at 398 Old Barnwell Road in Allendale, SC. At 7:30 PM the BAQ conducted a Public Hearing in the same location. Oral and written comments were received during the hearing.
- 01/26/2012 The Public Notice period ended for this PSD Construction Permit at 5:00 PM.
- 01/31/2012 The BAQ requested additional modeling to address comments received during the Public Notice period.
- 02/02/2012 The BAQ sent an E mail to the Trinity consultant asking for additional information concerning the facility's plan to control noise. On this same date, the BAQ received a reply with additional information concerning noise control.
- 02/06/2012 Additional modeling was received that addressed comments received during the Public Notice period.
- 02/08/2012 The BAQ issued a Final Determination and Construction Permit No. 0160-0023CA for PyraMax Ceramics, LLC.

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II. Introduction

On September 16, 2011 PyraMax Ceramics, LLC submitted a Prevention of Significant Deterioration (PSD) construction permit application to the South Carolina Department of Health and Environmental Control (DHEC), Bureau of Air Quality (BAQ).

PyraMax Ceramics, LLC (PyraMax) is proposing to construct a ceramic proppant manufacturing facility near Allendale, Allendale County, South Carolina. The Proppant Plant will produce proppant beads for use in the oil and natural gas industry. The major raw material is clay. The clay is mixed with chemicals and then fired in a kiln process to produce ceramic beads. Expected emissions from the facility are NO_x, CO, PM, PM₁₀, PM_{2.5}, SO₂, VOC, GHG and combustion emissions associated with natural gas and propane combustion. Additionally, hydrogen fluoride (HF), hydrogen chloride (HCl), and methanol will be emitted from the process either due to the presence in the raw material (HF and HCl) or as an impurity in the chemicals added (methanol).

The proposed proppant manufacturing facility will be a major source under the Federal Prevention of Significant Deterioration (PSD) program. This application includes PSD review for nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), greenhouse gases (GHGs), Volatile Organic Compounds (VOC), and sulfur dioxide (SO₂).

The proposed PyraMax proppant plant will consist of the following areas:

- raw material handling;
- feedstock preparation;
- pelletization;
- green pellet screening;
- calcinations/sintering; and
- finishing

The proposed facility will consist of four identical process lines. Each production line will have the same general process flow and operations. Some utilities will be shared between multiple lines. As a finished product, the ceramic proppant material produced by the facility will effectively be an “inert” material.

The facility will be located in Allendale County near the intersection of Concord Church Road and Augusta Highway in Allendale, South Carolina. The approximate UTM coordinates of the facility are 468.5 kilometers east and 3,654.6 kilometers north (UTM Zone 17).

The proposed plant will be a major source with respect to the Title V (Part 70) Operating Permit Program. The proppant plant is a major source due to potential emissions of criteria pollutants and hazardous air pollutants (HAPs) in excess of the major source thresholds (100 tpy for criteria pollutants, 10 tpy for individual HAP, 25 tpy for combined HAP). The facility will be required to submit a Title V permit application within 12-months of commencement of operation.

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The facility will be a major source of HAPs, having emissions of more than 10 tons per year of a single HAP, and 25 tons per year of a combination of HAPs. The primary HAPs emitted by facility processes include emissions of the acid gases HF and HCl from the facility kilns, and emissions of methanol from the facility pelletizers. Small combustion related emissions of other HAPs, such as nhexane, occur from natural gas combustion at the facility (or propane when it is used as a backup fuel). Because the emissions of facility-wide HAPs exceed the major source thresholds of 10 tons per year of a single HAP, and 25 tons per year of a combination of HAPs, and there is no NESHAP promulgated for ceramic pellet manufacturing facilities such as the PyraMax facility, then HAP emissions from the facility are subject to a Case-by-Case MACT determination under 112(g) of the Clean Air Act Amendments of 1990. The requirements for a Case-by-Case MACT analysis are outlined in 40 CFR Part 63, Subpart B, Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections 112(g) and 112(j).

Regulatory Applicability

The overall manufacturing process results in potential emissions that exceed the PSD significant thresholds. By virtue of the proposed emissions, this project is subject to review under the following standards in SC Regulation 61-62.5 and federal standards:

- Standard No. 1 *Emissions from Fuel Burning Operations*
- Standard No. 2 *Ambient Air Quality Standards*
- Standard No. 3 *Waste Combustion and Reduction*
- Standard No. 4 *Emissions from Process Industries*
- Standard No. 5.1 *Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) Applicable To Volatile Organic Compounds* (State only regulation)
- Standard No. 7 *Prevention of Significant Deterioration*
- SC Regulation 61-62.6 *Control of Fugitive Particulate Matter*
- SC Regulation 61-62.7 *Good Engineering Practice Stack Height*
- SC Regulation 61-62.60 *South Carolina Designated Facility Plan and New Source Performance Standards*
- 40 CFR 60 *Standards of Performance of New Stationary Sources, Subpart Dc, Standards of Performance for Small Industrial Commercial – Institutional Steam Generating Units*
- 40 CFR 60 *Standards of Performance of New Stationary Sources, Subpart UUU, Standards of Performance for Calciners and Dryers in Mineral Industries*
- 40 CFR 60 *Standards of Performance of New Stationary Sources, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*
- SC Regulation 61-62.63/40 CFR 63 *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories, Subpart A General Provisions*
- SC Regulation 61-62.63/40 CFR 63 *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories, Subpart B Requirements for Control*

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Technology Determinations for Major Sources in Accordance With Clean Air Act Sections, Sections 112(g) and 112(j)

- 40 CFR 63, *National Emission Standards For Hazardous Air Pollutants For Source Categories, Subpart A and Subpart ZZZZ*, National Emission Standards For Hazardous Air Pollutants For Stationary Reciprocating Internal Combustion Engines
- 40 CFR 63, *National Emission Standards For Hazardous Air Pollutants For Source Categories, Subparts A and Subpart DDDDD*--National Emission Standards For Hazardous Air Pollutants For Industrial, Commercial, And Institutional Boilers And Process Heaters
- SC Regulation 61-62.70 *Title V Operating Permit Program*
- 40 CFR 52 *Approval And Promulgation Of Implementation Plans*, Section 52.21 *Prevention Of Significant Deterioration Of Air Quality*

Significant Emission Rates

As shown in Table 1, this project exceeds the significant threshold as defined under PSD for PM, PM₁₀, PM_{2.5}, SO₂, NO_x, CO, VOC, and CO_{2e} emissions. HAP emissions are also shown in this table. Minor corrections were made to the emissions reflected in Table 1 as originally listed in the Preliminary Determination to recognize minor changes in calculated facility wide emissions. The changes do not affect any regulatory applicability or BACT determination.

Table 1. PyraMax Ceramics – PSD Applicability Analysis			
Pollutant	Controlled Emissions Increase	PSD Significant Threshold	Significant Increase?
	TPY	TPY	
PM	340.27	25	Yes
PM ₁₀	325.03	15	Yes
PM _{2.5}	217.51	10	Yes
SO ₂	205.49	40	Yes
NO _x	686.03	40	Yes
CO	1,227.49	100	Yes
VOC	223.22	40	Yes
Lead	0.0	0.6	No
CO _{2e}	337,932.80	75,000	Yes
Fluorides	0.38	3.0	No

III Air Quality Impact Analysis Updates

On December 15, 2011, the BAQ made a preliminary determination that the air quality analysis submitted by the PyraMax Ceramics, LLC facility showed that operation of the proposed facility would not cause or contribute to the violation of any state or federal air quality standard. The air

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quality analysis submitted did indicate that there were possible exceedances of air quality standards for SO₂, NO₂, and PM_{2.5}, but that the PyraMax facility did not cause and would not contribute to any exceedance of a standard in the ambient air. Subsequent to the preliminary determination, comments were received that questioned why emissions from the recently permitted SRE facility in Allendale County and a proposed ceramic facility in Millen, Georgia were not included in the air quality analysis. The BAQ determined that the emissions from the SRE facility had been included in the original air quality analysis, but that this had been inadvertently left out of the table describing which facilities' emissions were included. This error has been corrected in Table 23 and Table 25. The Bureau had been unaware that, just prior to the PyraMax application, an application for an air quality permit had been submitted for the proposed ceramic facility in Millen, Georgia. The Bureau determined that emissions from the proposed ceramic facility should have been included in the air quality analysis for NO₂. The Bureau requested that PyraMax update the air quality analysis to include these emissions. PyraMax updated the air quality analysis and submitted results that confirmed the PyraMax facility would not cause or contribute to the violations of any state or federal air quality standard. The Carbo, Millen GA facility has been added to Table 23 and Table 25 to reflect this change in the modeling.

The BAQ also investigated the possible exceedances predicted by the PyraMax air quality analysis. It was determined that the air quality analysis submitted by PyraMax double counted emissions from two off-site facilities. In addition, BAQ was able to obtain true PM_{2.5} emission rates for one off-site facility and these were used in place of the more conservative PM₁₀ emission rates that were used in the original air quality analysis. Also, BAQ refined the NO₂ analysis to correct slight errors in the positions of the sources and structures for one off-site facility. As a result of these revisions, the air quality analysis for the PyraMax facility indicates there are, in fact, no predicted exceedances of any standard in the ambient air. The modeling concentrations were corrected in Table 24 and Table 26 that reflect the revisions and refinements to the modeling as described above.

In addition to these changes, the results for the Soil and Vegetation Analysis were updated on Table 27 to reflect the revisions and refinements to the modeling as described above. Also, the PM₁₀ results had previously been left off of this table and were added to correct that omission. Other minor errors were discovered in the Maximum Impact concentrations listed for PM₁₀, PM_{2.5}, and CO in the Standard 2 Ambient Air Quality Analysis Table (Table 30) and were corrected.

Following is the Updated Modeling Analysis with the changes made as noted above:

For a major facility, PSD regulations require an applicant to analyze the impact from the construction of a proposed new source(s) on the following areas:

1. Compliance with the National Ambient Air Quality Standards (NAAQS);
2. Compliance with the PSD Increments;
3. Significant impact on PSD Class I Areas, including Class I PSD increments;
4. Impairments to visibility, soil, and vegetation; and
5. Air Quality impact of general growth associated with the source.

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All major sources proposing new construction or construction modifications in South Carolina (SC) are also required to demonstrate that their facility will remain in compliance with South Carolina Regulation 61-62.5 Standards 2 (AAQS), and 7 (Class II PSD Increments). The results of the Full Impact compliance demonstration show that there are no exceedances caused by the PyraMax facility. The modeling showed predicted exceedances of the 1-hr SO₂, 1-hr NO₂, and 24-hr and annual PM_{2.5} and PM₁₀ NAAQS; however, these exceedances are not caused by PyraMax. In the one exception where PyraMax contributions are above the SIL for an exceeding receptor, the receptor is on the property of an existing facility and there is no exceedance predicted without the contributions from that existing facility – thus there is no predicted exceedance at that receptor. Modeling submitted by PyraMax predicts compliance for all other ambient air quality standards and increments. In addition, during the review by BAQ, some double-counting of emissions were corrected and more realistic refinements were applied to the modeling. As a result, the modeling for the PyraMax facility predicts no exceedances of any NAAQS in the ambient air (see explanation below in Section B.2.a). It is also predicted that this project will cause no adverse effects on visibility, vegetation, or soils nor will there be any adverse effects on account of growth caused by this project.

All minor and major sources proposing new construction are also required to demonstrate compliance with South Carolina Regulation 61-62.5 Standard No. 8 (toxics) unless otherwise exempt. All emissions of toxic air pollutants from the proposed facility will be emitted from sources which will be in compliance with a Maximum Achievable Control Technology (MACT) standard at startup and/or are the product of the burning of virgin fuel. As such, the proposed facility is exempt from the requirements of Standard 8 and no modeling is required for this standard.

A. PSD Significant Determination

The PyraMax facility will be a new source. Since this facility is not listed in one of the 28 industrial categories defined in Standard 7, the PSD major source threshold is 250 TPY for any NSR (New Source Review) pollutant. Each pollutant increase is compared to this PSD threshold value. If a pollutant exceeds the threshold, the facility is determined to be “major” for PSD and will require a PSD Review. If one pollutant exceeds the threshold value, the remaining pollutants are then compared to the significant levels to determine which other pollutants also require a PSD review.

Table 20 lists the maximum potential emission rates for this project. Comparison of each pollutant to the respective PSD significance level indicates that PM₁₀, PM_{2.5}, SO₂, NO_x, CO, VOC/Ozone will require a PSD review to demonstrate compliance with Class II PSD increments (Standard 7) and Ambient Air Quality Standards (AAQS) (Standard 2).

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TABLE 20 PREVENTION OF SIGNIFICANT DETERIORATION (PSD) EMISSION RATES			
POLLUTANT	POTENTIAL EMISSIONS (TONS/YR)	PSD SIGNIFICANT EMISSION RATE (TONS/YR)	PSD REVIEW REQUIRED? (Yes/ No) (1)
PM₁₀	317.31	15	YES
PM_{2.5}	213.09	10	YES
SO₂	205.49	40	YES
NO_x	683.70	40 ⁽²⁾	YES
CO	1226.14	100	YES
Ozone (VOC)	250.48 ⁽³⁾	40 ⁽²⁾	YES
Fluorides	0.38	3	NO
Lead	--	0.6	NO
H₂S	--	10	NO
H₂SO₄ Mist	--	7	NO
1) Sources that exceed the significant threshold are required to perform an ambient impact analysis.			
2) Major for VOC's or NO _x is considered major for Ozone			
3) Emissions listed are for total VOCs.			

B. PSD Class II Modeling Analysis

The PSD Review requires pollutants, which are determined to be “major”, be evaluated by an Air Quality Impact Analysis and Additional Impacts Analysis. The Air Quality Impact Analysis consists of (1) a Preliminary Modeling Analysis to determine which pollutants from the proposed project at the facility only, exceed their Class II Significant Impact Levels (SIL); and (2) a more comprehensive Full Impact Analysis based on concentrations of pollutants that exceed the SIL for the facility and additional ‘facility-wide’ impacts from other facilities that may impact the Significant Impact Area (SIA). The Additional Impacts Analysis evaluates the impacts on soils, vegetation, and visibility effects.

B.1. PSD CLASS II PRELIMINARY MODELING ANALYSIS

Potential emission rates or net emission rate increases for each pollutant determined to be significant (Table 20.) at the facility were modeled to determine (a) the Significant Impact Level (SIL); (b) the impact area within which a Full Impact Analysis must be performed; and (c) whether or not the facility may be exempted from the ambient monitoring data requirements. Each of these three preliminary Class II analyses is discussed below.

B.1.a. SIGNIFICANT IMPACT LEVEL (SIL) ANALYSIS

If an impact is less than the SIL, then no further PSD analysis is required. Table 21 provides the results of the SIL modeling analysis for this project for the “major” pollutants as defined above. Maximum concentrations are used for the Significant Impact Level analysis (i.e. Highest-First-High) shows SILs were exceeded for PM₁₀, PM_{2.5}, SO₂, and NO₂ for the averaging periods indicated. Therefore, a Full Impact analysis was required for these pollutants. No further PSD analysis is

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required for CO; however, CO must be included in the facility-only South Carolina Standard 2 modeling. The Full Impact analysis assessed the combined impacts of the significant impact pollutants from the facility sources along with those from other sources in the Significant Impact Area (SIA) and the Screening Area as appropriate.

TABLE 21 CLASS II PREVENTION OF SIGNIFICANT DETERIORATION (PSD) SIGNIFICANT IMPACT LEVEL						
POLLUTANT	AVERAGING TIME	MODEL USED	MAXIMUM IMPACT (µg/m ³)	SIL (µg/m ³)	Exceeds SIL (Yes/No)	SIGNIFICANT IMPACT AREA (km)
PM ₁₀	24 HOUR	AERMOD	10.3	5	Yes	2.04
	ANNUAL	AERMOD	2.3	1	Yes	1.5
PM _{2.5}	24 HOUR	AERMOD	5.03	1.2	Yes	3.8
	ANNUAL	AERMOD	1.11	0.3	Yes	2.2
SO ₂	1 HOUR	AERMOD	9.62	8	Yes	2.2
	3 HOUR	AERMOD	8.79	25	No	Not applicable
	24 HOUR	AERMOD	3.39	5	No	Not applicable
	ANNUAL	AERMOD	0.54	1	No	Not applicable
NO ₂	1 HOUR	AERMOD	26.8	8	Yes	12.9
	ANNUAL	AERMOD	1.6	1	Yes	12.9
CO	1 HOUR	AERMOD	71.6	2000	No	Not applicable
	8 HOUR	AERMOD	41.1	500	No	Not applicable

Ozone is not modeled, but a general impact assessment is to be made if the source is major for ozone as determined in Table 20.

The Southeastern United States, including South Carolina, is NO_x limited with regards to ozone formation. This means that there is an excess of VOC in the atmosphere with regards to ozone formation and increases in VOC do not lead to increases in ozone production. The excess VOC is in part due to natural sources in the environment. Due to the excess VOC, only increases in NO_x in this region are a concern with regards to ozone formation. Ambient impacts from NO_x are addressed in NO₂ modeling.

Due to the highly complex reactions involving formation of ozone in the atmosphere, there is no “preferred” EPA guideline model for individual NO_x source emissions and, hence, ambient air quality demonstrations are not required to be included for NO_x (precursor for ozone). In order to estimate impacts on ozone, increases in NO_x from the project were compared with the total NO_x emissions from facilities in the surrounding SIA and SA. The total of the NO_x emissions for these facilities is 17,329 tons/year. The project NO_x emissions increase is 684 tons/year. This represents a NO_x emissions increase of just 3.95 % for the region. The representative ozone monitoring station for this area, located approximately 35 km from the project location, is the Ashton monitor located in Colleton County. The most recent design value of 0.066 ppm for this station shows that the area is currently in attainment with the 8-hour ozone standard. In fact, all South Carolina ozone monitoring

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data shows that the entire state is meeting this standard. Based on this small increase in NO_x, it is estimated that this project will have minimal impact on overall ozone formation within the surrounding area and should not exceed the current 8-hr ozone standard.

B.1.b. SIGNIFICANT IMPACT AREA (SIA) ANALYSIS

The impact area is a circular area with a radius extending from the source to (1) the most distant point where approved dispersion modeling predicts a significant ambient impact will occur (greater than or equal to the SIL), or (2) a modeling receptor distance of 50 km, whichever is less. An impact area is initially established for each pollutant for every averaging time. Sources within the SIA will be used for this analysis. Table B.2 indicates that the distances to significant impacts are 12.9 km for 1-hour NO₂, 1.5 km for annual NO₂, 3.8 km for 24-hour PM_{2.5}, 2.2 km for annual PM_{2.5}, 3.8 km for 24-hour PM₁₀, and 2.2 km for 1-hour SO₂.

B.1.c. SIGNIFICANT MONITORING CONCENTRATION ANALYSIS

Modeling significance results for SO₂, PM₁₀, NO₂, and CO are shown below along with significant monitoring concentrations for these pollutants. The significant monitoring concentrations are from SC Regulation 61-62.5, Standard No. 7. Impacts are the maximum modeled concentrations for each pollutant (i.e. Highest First High).

TABLE 22 SIGNIFICANT MONITORING CONCENTRATIONS				
Pollutant	Averaging Period	Max. Impact (µg/m ³)	Significant Monitoring Concentration (µg/m ³)	Exceeds (Y or N)
PM ₁₀	24-Hour	10.3	10	Y
PM _{2.5}	24-Hour	5.03	4	Y
SO ₂	24-Hour	3.39	13	N
NO ₂	Annual	1.61	14	N
CO	8-Hour	41.1	575	N

The maximum impacts for SO₂, NO₂, and CO are below the significant monitoring concentration (SMC) levels; therefore, no pre-construction monitoring is required for these pollutants. The PM₁₀ and the PM_{2.5} concentrations exceed the SMC. Section 2.4 of U.S. EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA-450/4-87-007) permits the use of existing representative air quality data in place of preconstruction monitoring data, provided monitor location, quality of data, and currentness of data are acceptable. According to the EPA document listed above, monitoring data from a regional site may be used as representative data in these cases. SC DHEC approves the use of data from the Jenkins Avenue station in Charleston County, SC for PM₁₀ background data and from the Charleston FAA Beacon, Charleston County, SC for PM_{2.5} background for this project. Both of these stations meet PSD modeling requirements. Since both are located in or near the urban Charleston area, the data will provide a conservative background compared to the rural location of the proposed facility.

SC DHEC also approves the use of the Jenkins Avenue SO₂ data as a conservative background for the project's full impact modeling. There are no non-urban NO₂ monitoring stations other than the Cape Romain station located in the Cape Romain Class I area on the coast of South Carolina. Since the Cape Romain location is not considered representative for the proposed facility location and the

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other available SC locations are overly conservative for the rural location of the proposed facility, the use of the data from the Paulding County site in Georgia was considered. The Paulding County station is located in a rural area about 45 km west of the Atlanta metropolitan area and is operated as part of the ambient monitoring network by the state of Georgia. The NO₂ data from this site meets the PSD modeling requirements for use as background data. SC DHEC approves the use of the Paulding County NO₂ data as a representative background for the projects full impact modeling.

B.2. PSD CLASS II FULL IMPACT MODELING ANALYSIS

A Full Impact Analysis is required for any pollutant for which the proposed source's estimated ambient pollutant concentrations meet or exceed the SIL's (determined in Table 21). Separate analyses are performed for determining compliance with the NAAQS and PSD increments. The NAAQS analysis must also include background pollutant concentrations. The Full Impact Analysis consists of modeling all facilities within the SIA, and those in the SA, which are not excluded by the screening protocol. The SA used is an area extending 50 km beyond the SIA for each pollutant and averaging period. The "Screening Threshold Method for PSD Modeling" or "20D Rule" was used to determine which sources within the Screening Area to include.

In order to exclude a source, the annual emissions of a pollutant must be less than 20 times the distance (km) from the SIA to the source in the screening area. Sources within 2 km of each other were summed prior to applying the 20D Rule. Each calculated 20D distance was compared to the annual emission of each pollutant. Those sources with annual emissions greater than or equal to 20D were retained and considered in both the Full Impact modeling analysis for the Class II NAAQS analysis and the Class II PSD Increment analysis.

Example Calculation:

$$Q \text{ (tpy)} < 20 * D \text{ (km)}$$

Q = total annual emissions for source being evaluated for inclusion (each pollutant must be addressed)

D = distance from the SIA boundary to the facility considered for inclusion

Where:

$$D = [(x_1 - x_2)^2 + (y_1 - y_2)^2]^{1/2} - R$$

R = distance from the PSD Source to the edge of the SIA, or 50km, whichever is less

x₁, y₁ = coordinates of the source being considered for exclusion (in kilometers)

x₂, y₂ = coordinates of the PSD Source (in kilometers)

B.2.a. PSD CLASS II FULL IMPACT - NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) ANALYSIS

Table 23 shows a list of facilities that are included in the full impact analysis for NAAQS modeling. A detailed listing of dispersion parameters of each off-site source, as well as each respective modeled emission rate included in the Class II NAAQS Full Impact Analysis, is included in the facility's application (Dated September 2011, and subsequent revisions and/or additions) and the corresponding electronic modeling files. Those tables were not re-produced for this summary.

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TABLE 23 CLASS II FULL IMPACT ANALYSIS – NAAQS SIA AND 20D SOURCES				
PM₁₀	PM_{2.5}	SO₂	NO₂	CO
Collum's Lumber Mill	Collum's Lumber Mill	Collum's Lumber Mill	Collum's Lumber Mill	
			Fairfax Dimension Co., Inc. (closed)	
Grant Allendale L.P.	Grant Allendale L.P.	Grant Allendale L.P.	Grant Allendale L.P.	
Savannah River Nuclear Solutions LLC Savannah River Site-D-Area Powerhouse	Savannah River Nuclear Solutions LLC Savannah River Site-D-Area Powerhouse	Savannah River Nuclear Solutions LLC Savannah River Site-D-Area Powerhouse	Savannah River Nuclear Solutions LLC Savannah River Site-D-Area Powerhouse	
			Savannah River Nuclear Solutions LLC-Savannah River Site	
SRE-Allendale	SRE-Allendale	SRE-Allendale	SRE-Allendale	
		Milliken and Company		
		Nevarmar		
		Georgia Pacific		
		Ameresco Federal Solutions		
		SCE&G-Cope	SCE&G-Cope	
CO was eliminated in the Significant Impact Level analysis.				

The results of the Full Impact compliance demonstration show that there are no exceedances caused by the PyraMax facility. The modeling submitted by PyraMax predicted possible exceedances of the 1-hr SO₂, 1-hr NO₂, and 24-hr and annual PM_{2.5} and PM₁₀ NAAQS; however, these exceedances are not caused by PyraMax. In the one exception where PyraMax contributions are above the SIL for an exceeding receptor, the receptor is on the property of an existing facility (which is not ambient air for that facility) and there is no exceedance predicted without the contributions from that existing facility -- thus there is no predicted violation of the NAAQS.

During the review by BAQ, it was determined that the modeling submitted by PyraMax double counted emissions from two off-site facilities. In addition, BAQ was able to obtain true PM_{2.5} emission rates for one off-site facility and these were used in place of the PM₁₀ emission rates that were used in the original modeling. Also, BAQ refined the NO₂ analysis to correct slight errors in the positions of the sources and structures for one off-site facility. Finally, BAQ was able to obtain fence line coordinates for the off-site facility where the highest concentrations were predicted. As a result of these revisions and refinements, the full impact modeling for the PyraMax facility indicates there are no predicted exceedances of any NAAQS in the ambient air.

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Table 24 NATIONAL AMBIENT AIR QUALITY STANDARDS CLASS II FULL IMPACT ANALYSIS							
Pollutant	Averaging Time	Model Used	Maximum Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total (µg/m³)	Standard (µg/m³)	% of Standard
PM ₁₀	24 Hour	AERMOD	47.7 ⁽¹⁾	47.0	95	150	63
PM _{2.5}	24 Hour	AERMOD	34.3 ⁽¹⁾⁽²⁾	N/A	34	35	97
	Annual	AERMOD	4.5 ⁽¹⁾	9.4	14	15	93
SO ₂	1 Hour	AERMOD	107.2 ⁽¹⁾	79.4	187	196	95
NO ₂	1 Hour	AERMOD	115.2 ⁽¹⁾⁽³⁾	35.8	151	188	80
	Annual	AERMOD	57.2 ⁽³⁾	5.2	62	100	62
Backgrounds are summarized in Section E.							
⁽¹⁾ Ambient air results obtained by BAQ during review-see explanation above.							
⁽²⁾ Includes monthly maximum background added by AERMOD during the model run for the Long Creek station, averaged over the 2008-2010 period.							
⁽³⁾ The NO ₂ modeling results were based on the application of the ARM (0.8).							

B.2.B. PSD CLASS II FULL IMPACT - PSD INCREMENT ANALYSIS

The full impact analysis for PSD increment consuming sources is performed in the same manner as the full impact analysis for the NAAQS shown above. The sources included are all increment consuming sources from the facility and those previously identified within the SIA and SA.

TABLE 25 PSD CLASS II FULL IMPACT ANALYSIS SIA and 20D PSD INCREMENT CONSUMING SOURCES			
PM₁₀	PM_{2.5}	SO₂	NO_x
Collum's Lumber Mill	Collum's Lumber Mill	Collum's Lumber Mill	Collum's Lumber Mill
			Fairfax Dimension Co., Inc. (closed)
Grant Allendale L.P.	Grant Allendale L.P.	Grant Allendale L.P.	Grant Allendale L.P.
Savannah River Nuclear Solutions LLC Savannah River Site-D-Area Powerhouse	Savannah River Nuclear Solutions LLC Savannah River Site-D-Area Powerhouse	Savannah River Nuclear Solutions LLC Savannah River Site-D-Area Powerhouse	Savannah River Nuclear Solutions LLC Savannah River Site-D-Area Powerhouse
			Savannah River Nuclear Solutions LLC-Savannah River Site
		Milliken and Company	
		Nevarmar	
		Georgia Pacific	
		Ameresco Federal Solutions	
		SCE&G-Cope	SCE&G-Cope
Collum's Lumber Mill	Collum's Lumber Mill	Collum's Lumber Mill	Collum's Lumber Mill

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TABLE 25 PSD CLASS II FULL IMPACT ANALYSIS SIA and 20D PSD INCREMENT CONSUMING SOURCES			
PM₁₀	PM_{2.5}	SO₂	NO_x
Grant Allendale L.P.	Grant Allendale L.P.	Grant Allendale L.P.	Grant Allendale L.P.
SRE-Allendale			SRE-Allendale

The emissions from the proposed PyraMax facility were combined with those from additional non-facility sources identified in Table 25 and included in the PSD Class II Full Impact Increment modeling analysis. Table 26 indicates that the maximum impact for each averaging period and each pollutant was determined to be less than the PSD increment standard for each averaging period. Highest-first-high values were used for annual averaging periods and highest-second-high for all short-term averaging periods.

Table 26 CLASS II PREVENTION OF SIGNIFICANT DETERIORATION FULL IMPACT INCREMENT ANALYSIS					
POLLUTANT	AVERAGING TIME	MODEL USED	MAXIMUM MODELED CONCENTRATION (µg/m³)	STANDARD (µg/m³)	% OF STANDARD
PM ₁₀	24 Hour	AERMOD	9.17	30	31
	Annual	AERMOD	2.30	17	14
PM _{2.5}	24 Hour	AERMOD	5.37	9	60
	Annual	AERMOD	1.29	4	32
SO ₂	3 Hour	AERMOD	NA*	512	NA*
	24 Hour	AERMOD	NA*	91	NA*
	Annual	AERMOD	NA*	20	NA*
NO ₂	Annual	AERMOD	1.85	25	7

The highest-first-high modeled concentrations for the 5 years of Meteorological data are listed for annual averaging periods and the highest second-high for other averaging periods.
 * The SIL was not exceeded for this averaging period so a full impact increment analysis was not required.

Dispersion parameters of each point, volume, and area source, as well as, each respective modeled emission rate included in the PSD Increment Class II Full Impact analysis are included in the facility’s application (Dated September 2011, and subsequent revisions and/or additions) and the corresponding electronic modeling files.

C. Additional Impacts Analysis – Growth, Soils and Vegetation, and Visibility Impairment

PSD review requires an analysis of any potential impairment to visibility, soils, and vegetation that may occur as a result of the proposed or modified facility/sources. The review also requires an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with the expansion.

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1. Growth

The SC PSD rules require the applicant to provide information relating to the nature and extent of air quality impacts from all commercial, residential, industrial and other growth, which has occurred since August 7, 1977, in the area the facility, or modification, would affect. For the purposes of this report, the area the facility would affect is defined as the area of significant impact. The greatest significant impact distance was determined to be 12.9 km. The facility will have approximately 66 employees. It is anticipated that the workforce will come from already existing local population in an area where unemployment is high. The clay raw material will come from an existing mine. There will be increased truck traffic between the mine site and the proposed facility location but the increase (compared to growth without the facility) will be minimal. The closest mine site supplying materials to the site would be expected to be outside the SIA for all pollutant averaging periods. Therefore, the construction and modification of the facility and any workforce growth associated residential and commercial growth is not expected to cause or contribute a quantifiable adverse impact on local ambient air quality.

2. Soils and Vegetation

Maximum predicted offsite impacts (highest first high) were compared to EPA secondary NAAQS or screening levels. The only predicted impacts exceeding these concentrations were for the full impact 24-hour and annual PM₁₀ modeling. However, as previously mentioned, emissions from the proposed facility do not cause or contribute to any predicted violations. Thus, modeling of all the proposed emissions for the soils and vegetation analysis indicates that there will be no adverse impacts expected on soils or vegetation caused by this proposed facility.

Table 27 SOILS AND VEGETATION ANALYSIS								
Pollutant	Averaging Time	Model Used	MAX. Impact (µg/m³)	Back-ground (µg/m³)	Facility / Regional Impact (µg/m³)⁽²⁾	EPA Screening Concentration (µg/m³)	AAQS Standard (µg/m³)	Exceeds?
PM ₁₀	24 Hour	AERMOD	47.7 ⁽³⁾	47	95	N/A	150	No
	Annual	AERMOD	2.3 ⁽¹⁾	17.2	20	N/A	50	No
SO ₂	1 Hour	AERMOD	107.2 ⁽³⁾	79.4	187	917	N/A	No
	3 Hour	AERMOD	8.8 ⁽²⁾	65.7	75	786	1300	No
	Annual	AERMOD	0.5 ⁽²⁾	3.1	4	18	80	No
NO ₂	4 Hour ⁽²⁾	AERMOD	93.7 ⁽³⁾⁽⁴⁾	78.1	172	3760	N/A	No
	8 Hour ⁽²⁾	AERMOD	93.7 ⁽³⁾⁽⁴⁾	78.1	172	3760	N/A	No
	1 Month ⁽²⁾	AERMOD	93.7 ⁽³⁾⁽⁴⁾	78.1	172	564	N/A	No
	Annual	AERMOD	57.2	15.6	73	94	100	No
CO	1 Week ⁽⁴⁾	AERMOD	39.7 ⁽⁵⁾	1412.2 ⁽⁵⁾	1452	1,800,000	N/A	No
Fluoride	10 Day ⁽⁴⁾	AERMOD	0.3 ⁽⁵⁾	N/A	0.3	0.5	--	No
1) Full Impact Class II Increment results used for PM ₁₀ annual as full impact NAAQS modeling was not required.								
2) Concentrations include only the facility impacts since they either did not exceed the Significant Impact Levels or none were available. All other values include full impact sources.								

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Table 27 SOILS AND VEGETATION ANALYSIS								
Pollutant	Averaging Time	Model Used	MAX. Impact ($\mu\text{g}/\text{m}^3$)	Back-ground ($\mu\text{g}/\text{m}^3$)	Facility / Regional Impact ($\mu\text{g}/\text{m}^3$) ⁽²⁾	EPA Screening Concentration ($\mu\text{g}/\text{m}^3$)	AAQS Standard ($\mu\text{g}/\text{m}^3$)	Exceeds?
3)Ambient air results obtained by BAQ during review—see explanation above.								
4)NO ₂ 1-hr results conservatively used for the 4-hr, 8-hr , and 1 month averaging periods.								
5) Non-Standard Averaging period was conservatively estimated as follows: 1 Week CO= 8-hour concentration compared to weekly standard. Background is also 8-hour value. 10 Day Fluoride=24-hour concentration was compared to 10-day standard.								

3. Visibility

Visibility analyses for Class II areas are not necessary for this project, as there are no visibility sensitive located within the project’s Significant Impact Area (SIA) for non 1-hr NAAQS pollutants.

D. PSD Class I Impact Analysis

The 2010 FLAG document allows the screening of sources based on total emissions of certain pollutants and distance from the source to the Class I area. When a source is screened out with $Q/D \leq 10$ (where D = distance from the source to the Class I area in kilometers; Q = TPY of SO₂ + NO_x + PM₁₀ + H₂SO₄), the facility is not required to do an AQRV analysis.

For this project, the source was below the screening level for all Class I areas within 300 km and no AQRV analysis was required. $Max\ Q/D = 6.08 \leq 10$ where D = 203 kilometers (Shining Rock) and Q = 1232 TPY (SO₂ = 205, NO_x = 700, PM₁₀ = 327, and H₂SO₄ = 0).

D.1. CLASS I SIGNIFICANT IMPACT LEVEL ANALYSIS

For the Class I SIL analysis, PyraMax modeled 360 receptors located 50 km from the facility (the maximum recommended range of AERMOD) surrounding the facility. Since the closest Class I area is 203 km from the facility, this modeling is a conservative screening of the significant impact at the Class I areas. Table 28 shows the maximum impacts at these receptors compared to the prospective SILs. The air quality impacts are less than the Class I SILs for PM₁₀, NO₂, and SO₂ for all averaging periods and for PM_{2.5} for the annual averaging period.

Table 28 CLASS I PSD SIGNIFICANT IMPACT LEVEL ANALYSIS					
Pollutant	Averaging Time	Model Used	Maximum Modeled Concentration ($\mu\text{g}/\text{m}^3$)	SIL ($\mu\text{g}/\text{m}^3$)	Significant Impact?
PM _{2.5}	24 HOUR	AERMOD	0.14	0.07	Y
	ANNUAL	AERMOD	0.01	0.06	N
PM ₁₀	24 HOUR	AERMOD	0.21	0.32	N
	ANNUAL	AERMOD	0.02	0.16	N
SO ₂	3 HOUR	AERMOD	0.5	1.0	N
	24 HOUR	AERMOD	0.1	0.2	N
	ANNUAL	AERMOD	0.0	0.1	N
NO ₂	ANNUAL	AERMOD	0.0	0.1	N

Highest First-high values is shown for all pollutants and averaging periods.

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D.2. CLASS I INCREMENT CONSUMPTION IMPACT ANALYSIS

The maximum predicted concentration is greater than the applicable Class I SIL for the PM_{2.5} 24-hour averaging period. Since the PM_{2.5} 24-hour impact exceeds the Class I SIL using the screening approach, PyraMax had to assess PSD Class I Increment at the Class I area (Cape Romain) itself, including other increment consuming sources in the domain. The only other increment-consuming source in the area, to date, is the Showa Denko Carbon facility in Ridgeville, SC, which is located between PyraMax and Cape Romain at roughly 60 km from the Class I area. PyraMax reviewed the Class II modeling analysis conducted as part of that PSD application and determined that the PM_{2.5} SIA for the Class II analysis was 13 km. As such, the impact from Showa Denko would be less than 1.2 ug/m³ (the Class II SIL for PM_{2.5}) at the Cape Romain Class I area, since it is more than 13 km distant. This concentration was added to the PyraMax facility's impact from the Class I Significance run from AERMOD. This approach is very conservative as it assumes the maximum impact from PyraMax sources and Showa Denko sources would occur at the same, more distant Class I receptor, and at the same time. Using this conservative approach, the PM_{2.5} Class I increment results are within the allowable increments.

TABLE 29 CLASS I PSD INCREMENT IMPACTS CAPE ROMAIN NATIONAL WILDLIFE REFUGE					
Pollutant	Averaging Time	Model Used	Maximum Modeled Concentration (µg/m³)	Standard (µg/m³)	Exceeds Standard?
PM _{2.5}	24 HOUR	AERMOD	1.34	2.00	N
	ANNUAL	AERMOD	0.31	1.00	N
Highest First-high values used for all pollutants and averaging periods.					
Standards are from SC Regulation 61-62.5 Standard 7, Class I Area limits.					

D.3. CLASS I VISIBILITY ANALYSIS

D.4. CLASS I DEPOSITION ANALYSIS

Since the facility screened out of the Class I AQRV analysis based on their Q/D calculation, analyses for visibility and deposition are not required.

E. South Carolina Facility-wide Compliance Demonstration

All minor and major sources proposing new construction or construction modifications in South Carolina are required to demonstrate compliance with South Carolina Regulation No. 62.5 Standards Nos. 2 (NAAQS), 7 (Class II PSD Increment), and 8 (Air Toxics). Standard No. 7 (PSD) Part k - "Source Impact Analysis" and Part p - "Sources Impacting Federal Class I Areas - Additional Requirements" require Class II modeling. Facility-wide emissions from the PyraMax facility only were modeled to demonstrate compliance with Standards 2, and 7. As mentioned above, the facility is exempt from Standard 8 modeling requirements.

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Table 30 STANDARD NO. 2 - AMBIENT AIR QUALITY STANDARDS MODELING ANALYSIS							
Pollutant	Averaging Time	Model Used	Maximum Modeled Concentration (µg/m³)⁽¹⁾	Background Concentration (µg/m³)	Total (µg/m³)	Standard (µg/m³)	% of Standard
PM ₁₀	24 Hour	AERMOD	10.3	47.0	57	150	38
	Annual	AERMOD	2.3	17.2	20	50	40
PM _{2.5}	24 Hour	AERMOD	5.03 ⁽²⁾	20.0	25	35	71
	Annual	AERMOD	1.11 ⁽³⁾	9.4	11	15	73
SO ₂	3 Hour	AERMOD	8.79	65.7	74	1300	6
	24 Hour	AERMOD	3.39	23.2	27	365	7
	Annual	AERMOD	0.54	3.1	4	80	5
NO ₂	Annual	AERMOD	1.6	5.2	7	100	7
CO	1 Hour	AERMOD	71.6	2022.8	2094	40,000	6
	8 Hour	AERMOD	41.1	1412.2	1453	10,000	15
Gaseous Fluorides	12 Hour	AERMOD	0.37	⁽⁴⁾	0.37	3.7	10
	24 Hour	AERMOD	0.30	⁽⁴⁾	0.30	2.9	10
	Weekly	AERMOD	0.30 ⁽⁷⁾	⁽⁴⁾	0.30	1.6	19
	Monthly	AERMOD	0.10	⁽⁴⁾	0.10	0.8	13
1) The highest-first-high modeled concentration (from the significant impact analysis) was used for all averaging periods, except as noted.							
2) The maximum 24-hr average, averaged over the five years of modeling, was used.							
3) The maximum annual average, averaged over the five years of modeling, was used.							
4) There is no background value for HF.							
7) The 24-hour average concentration was used to compare to the weekly standard. This is a conservative approach.							

IV Final Determination

On December 15, 2011, the BAQ made a preliminary determination that the PyraMax Ceramics, LLC facility may be constructed if the emission limitations and conditions outlined in Draft PSD/NSPS/NESHAP/112g Construction Permit No. 0160-0023-CA are met. This draft construction permit was included as Appendix D of the Preliminary Determination. The Statement of Basis that contains explanations of the permitting actions was included as Appendix E of the Preliminary Determination. The Public comment period closed on January 26, 2012. Comments were received from the public during and after the Public Hearing. These comments are addressed below in the Comments and Response section. No comments were received from the United States Environmental Protection Agency (EPA), the Federal Land Manager (FLM), or PyraMax Ceramics, LLC during the public comment period.

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Since the Preliminary Determination was issued, the need for several corrections has been identified. On page 24 & 25 The NSPS, subpart III PM emission limit was applicable to the emergency engines and should have been included in the PM BACT. The PM emission limit was added to Construction Permit Condition 5.B.9 and have been included on page 76, Table 19 of the preliminary determination. Page 38 the minimum estimated cost to control CO was listed as \$13,800/ton in the CO BACT determination. The actual minimum cost/ton is \$11,200. This minor cost difference does not affect the result of the determination. The courts lifted the stay the effective date of NESHAP, subpart DDDDD after the preliminary determination and draft permit was put on public notice. Subpart DDDD now applies to the boilers and the permit was modified to reflect this change.

On February 8, 2012 the BAQ made a final determination that the PyraMax Ceramics, LLC facility proposed project may be approved provided the emission limitations and conditions outlined in Construction Permit No. 0160-0023-CA are met. The Appendix A of this Final Determination contains a copy of the final issued construction permit.

V. Comments and Responses

The following is the SC Department of Health and Environmental Control's (DHEC) Bureau of Air Quality (Department) response to the comments made and issues raised during the formal comment period held December 15, 2011 – January 26, 2012 and the public hearing held on January 19, 2012, regarding the draft construction permit for PyraMax Ceramics, LLC (PyraMax or "facility") at 2636 Augusta Highway in Allendale, Allendale County. The written comments received regarding the draft permit are available for viewing at the SC DHEC Columbia office located at 2600 Bull Street, Columbia, SC 29201, or on the SC DHEC webpage <http://www.scdhec.gov/environment/baq/PermittingDecisions>, or hardcopies can be requested by contacting our Freedom of Information Office at (803) 898-3817.

- 1. General Opposition and Support** - The Department received general comments both supporting and opposing the issuance of a permit for this facility. Title 48 of the SC Code of Laws, Section 48-1-100, states that "If, after appropriate public comment procedures, as defined by Department regulations, the Department finds that the discharge from the proposed outlet or source will not be in contravention of provisions of this chapter, a permit to construct and a permit to discharge must be issued to the applicant." The Department cannot make permitting decisions based on community approval or disapproval of the company/facility. The Department does not make permit decisions based on the number of individuals or groups that support or oppose a project. The Department's decision is based on the Department's technical review of an applicant's application and the regulatory requirements in place at the time of the Department's review. The Department welcomes and appreciates all comments made regarding the PyraMax facility.
- 2. Land Use/Zoning** – There were comments concerning the location of facility relative to residential areas and personal property. There were also comments based on how the proposed property is presently zoned. All zoning decisions are made at the local level by a city or county zoning authority. The Department cannot dictate where a facility locates. Please contact your local

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city or county council representatives for more information on how to get involved in local zoning and planning issues.

3. **Property Ownership** – A comment pointed out an apparent contradiction in regards to property ownership. Condition 5.C.1 of the PyraMax draft construction permit included a statement that, “PyraMax has purchased sufficient property and will maintain a boundary layer of vegetation/wetlands to minimize the amount of dust that is transported off-property.” The construction permit condition 5.C.1 has been modified to delete the portion of the final bullet point dealing with the purchase of property and reworded to state that PyraMax will maintain a boundary layer of vegetation/wetlands to minimize the amount of dust that is transported off-property.
4. **Facility Location** - One commenter indicated that PyraMax chose not to locate the proposed facility in the vicinity of existing emission sources because they could not comply with the standards if the facility was too near those other sources. The Department has no information on whether or not the facility could meet the ambient air quality standards in a location other than the one that has been proposed. The permit decision takes into account only whether the facility will or will not cause or contribute to a violation of state and federal air standards when operating at the proposed location. Please see response number 2 addressing zoning and land use.
5. **Noise** – Comments were received regarding noise created by the facility. The Department does not have any noise regulations and therefore cannot regulate noise levels. Allendale County does not have a noise ordinance in place at this time. We have asked the facility how they plan to address noise issues. In their response, PyraMax stated that they have visited existing ceramic proppant facilities and did not experience noise levels that would raise concern from community members. They also stated that the PyraMax property will be approximately 160 acres. The facility footprint is approximately 20 acres and will be located in the central part of the property. The nearest distance from the process equipment to the property line will be more than 800 feet. The facility intends to keep the natural landscape buffer in place at the edges of the property (i.e., the entire property will not be clear cut). Due to the central location, distance from the plant to the property, and maintaining the natural landscape buffer, noise from the plant will be minimized. The facility noted that the majority of the process equipment is to be located indoors. In addition, there will be sound enclosures around fans and the facility will employ good manufacturing practices to reduce the noise generated from the facility.
6. **Odor** – A comment was received regarding potential odor from the proposed facility. There are no state or federal odor regulations. However, the Department’s regional offices investigate citizen complaints, including odor complaints. The presence of odor does not necessarily signal the presence of dangerous air pollution. Many air pollutants have an odor threshold far below the level that would cause harm.
7. **Permit Material was Difficult to Understand** – The Department recognizes that the air permitting process is complex and complicated. When holding a hearing, it is even harder to keep information short and to the point because we are discussing all information pertaining to the air permit. We encourage stakeholder input and suggestions for improving our presentation methods.

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If our materials and presentations are not in plain language, we value your constructive feedback to improve them. We will strive to explain the concepts of this very complex and complicated program to citizens in more simplistic and basic terms. If you have any suggestions on improving the presentations or improving the public meeting and hearing process, please feel free to contact Lawra Boyce, Public Participation Coordinator for the Bureau of Air Quality, at (803) 898-4585 or boycelc@dhec.sc.gov.

8. **Health Impacts** – There were several comments regarding the impact on human health. In order to receive an air permit, the facility must demonstrate that they are in compliance with air quality standards set by the Environmental Protection Agency (EPA) and DHEC. The Clean Air Act requires the EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national ambient air quality standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA has set these National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called "criteria" pollutants: particulate matter, nitrogen dioxide, sulfur dioxide, ozone, carbon monoxide and lead. The NAAQS are reviewed every 5 years and updated as necessary so that concerns regarding the health of sensitive individuals and protection of welfare are incorporated into air quality standards. PyraMax has demonstrated through air dispersion computer modeling that the maximum pollutant concentrations are below these standards. The permit requires stack testing, monitoring of pollution control devices, fuel restrictions, continuous opacity monitoring, and recordkeeping and reporting to ensure the facility will meet the regulatory requirements.

9. **Air Quality Impacts** – Comments were received concerning the air quality impacts from this facility. The Clean Air Act is designed to protect local air quality from potential pollution impacts from large sources through the Prevention of Significant Deterioration (PSD) permitting process. In order to receive a PSD permit, a facility must apply Best Available Control Technology (BACT) to its equipment and the facility must conduct an air quality analysis to demonstrate it will not cause or contribute to an exceedance of an air quality standard or other protective levels set by the EPA. The air quality model takes into account the maximum emissions from the proposed facility and the pollutant impacts from other facilities in the area. The model demonstrated compliance.
 - a. **Predicted Exceedances of the Air Quality Standards** - One commenter questioned the predicted exceedance inside the property boundary of an existing facility. The modeling showed that there are no exceedances of any standard caused by the PyraMax facility. The modeling did show that PyraMax contributions were above significant impact levels on the property of an existing facility. However, the existing facility is causing the exceedances on their own property. Air quality regulations address impacts to *ambient* air quality. Ambient air is air outside of facility boundaries; therefore, there was no exceedance of the standards.

Updates to the air quality analysis: As presented at the public hearing, the air quality model has been updated since the notice of the draft permit. As stated in the preliminary

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determination, the modeling analysis did show predicted exceedances of the 1-hour sulfur dioxide ambient air quality standard, the 1-hour nitrogen dioxide ambient air quality standard and the 24-hour coarse and fine particulate matter ambient standard, not from PyraMax, but from existing facilities. The Department reviewed the emission data submitted by PyraMax and, after removing inaccuracies and also further refining emissions determined there were no predicted exceedances from any existing facilities. The air quality analysis for the PyraMax facility indicates there are, in fact, no predicted exceedances of any standard in the ambient air. Please refer to the final determination for a more detailed explanation of the modeling changes.

- b. Omission of Sources in the Air Quality Model – One commenter indicated that all polluting sources should be included in the modeling. EPA guidance allows off-site sources to be excluded from the modeling based on considerations such as the amount of the emissions and the distance from the existing facility to the significant impact area. Some of these considerations are based on the limits on the effective range of the model, which is 50 kilometers; therefore, sources outside that range were excluded. EPA also recognizes that some off-site sources contributions would be insignificant or would be accounted for in the background concentrations that are added to the model. These exclusions are based on the level of an off-site source’s emissions combined with the distance an off-site source’s emissions would travel to reach the permitted facility. This EPA guidance was appropriately applied to exclude those off-site sources that were not included in the PyraMax modeling. In addition, appropriately conservative background concentrations were added to the concentrations predicted by the modeling that more than compensates for those excluded sources.

Omission of Truck Traffic. The number of trucks traveling from the mine to the proposed facility is estimated to be 175 trucks per day. The primary road traveled in Allendale County between the mine site and the proposed location will be route 278. PyraMax reviewed information from the South Carolina Department of Transportation, located at <http://www.scdot.org/getting/aadt.asp>, for the annual average daily traffic for route 278 from the Barnwell County line to Concord Church Road (SR-53) for the last five years of available data. That data showed that the average daily traffic for that route is 3,400 vehicles per day. That means the increase in daily traffic at maximum continuous operation (a conservative assumption) would be approximately 5%. The increase in truck traffic was determined to be minimal compared to the historical traffic patterns in the area and therefore, the corresponding increase in emissions would also be considered minimal and was excluded. Also, according to the EPA guidance, a facility is not required to include the growth of vehicle emissions in their modeling for the National Ambient Air Quality Standards. However, the Department does take into account vehicle emissions when conducting the regional models for the State, usually every five years.

Omission of SRE Allendale. The projected emissions for SRE Allendale were included in the modeling analysis. Table 23 of the preliminary determination inadvertently left that information out of the listing. The final determination will include that information.

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Omission of Sources in the State of Georgia. The PyraMax application included an inventory of major and minor source facilities in Georgia to be considered for inclusion in the modeling. As stated earlier, EPA guidance allows exclusion of sources outside 50 kilometers from the significant impact area; therefore Georgia facilities outside the 50-kilometer area were excluded. EPA guidance also allows for exclusions within the 50-kilometer range. This approved process of excluded sources is called “screening.” To be screened, emissions from the off-site source must be less than 20 times the distance from the Georgia facility to the significant impact area. Eight Georgia facilities met this screening criteria and were excluded from the model. One commenter identified a proposed ceramic facility in Millen, Georgia that was not included in the PyraMax modeling. Because the proposed location for this facility is within 50 kilometers of the PyraMax significant impact area it should have been included in the model and therefore, the Department requested PyraMax to update the model. The facility performed and submitted the requested modeling. The results of this updated modeling analysis show that the construction and operation of the new PyraMax facility will not cause or contribute to the exceedance any state or federal ambient air quality Standard. Please refer to the final determination for a detailed discussion of the modeling.

- c. **Impacts to Soils and Vegetation** - There was a comment regarding the impact of the PyraMax facility to the soils and vegetation in the area. The operation of the proposed project does cause dry particles and gaseous vapors to be formed. These particles and vapors are frequently called pollutants or pollution. The Department places permit limits on the amount and type of emissions a facility is allowed to emit to ensure Federal and State air quality pollution standards can be met. In order to receive an air quality permit, the facility must demonstrate that they will not cause or contribute to a violation of any air quality standard. Secondary standards (as discussed in the Health Impacts response above) set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The air dispersion modeling shows that the proposed facility will meet all ambient air quality standards. Under PSD requirements, PyraMax also conducted a soil and vegetation modeling analysis. The EPA has set screening levels to determine if there is any potential harm to soil and vegetation at the facility fence line and beyond into the community. The results of the modeling analysis were below the EPA screening levels indicating that operation of the proposed facility is not expected to cause harm to the soil and vegetation.
10. **Best Available Control Technology Analysis** –The Clean Air Act is designed to protect local air quality from potential pollution impacts from large sources through the Prevention of Significant Deterioration (PSD) permitting process. In order to receive a PSD permit, a facility must apply Best Available Control Technology (BACT) to its equipment and the facility must conduct an air quality analysis to demonstrate it will not cause or contribute to an exceedance of an air quality standard or other protective levels set by the EPA. BACT is an emission limit and includes pollution control equipment or, a required modification of production processes or methods. If an emission limitation is infeasible, BACT can be a design, equipment, work practices or operational standards. BACT is determined on a case by case basis to obtain the maximum reduction in emissions achievable for the proposed source. In order to have national consistency on how to determine BACT, the EPA recommends, and the Department uses, a five

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step process in which all possible control technologies are identified, ranked for effectiveness, and BACT determined. Control technologies can be eliminated from consideration because they are demonstrated to be technically infeasible, or have unacceptable energy, economic, or environmental impacts.

- a. Cost effectiveness review did not take into account health and environment of Allendale citizens. In most cases in the PyraMax BACT analysis, the most effective control technology was chosen in determining the BACT emission limitation. In those instances where a control technology was eliminated from consideration the Department not only considered the economics, but also the additional energy and environmental impacts in that determination. For example, a regenerative thermal oxidizer (RTO) was eliminated as a control option for CO emissions from the kilns. Use of the RTO would require the combustion of additional natural gas to reheat the flue gas to the appropriate temperature for the RTO to function. This additional natural gas combustion would lead to additional pollutant emissions such as NO_x emissions and increased energy usage. The Department determined the RTO could be eliminated based on the additional NO_x emissions, increased energy usage and an economic cost of \$21,200 per ton of CO reduced. The application of BACT will reduce emissions from the PyraMax facility and therefore, reduce risk to the citizens in Allendale. Additionally, the air quality analysis showed that emission impacts from the facility would not threaten ambient air quality standards. The commenter did not supply any information or data that would indicate at what cost a control device or other pollution reduction method would be considered economically infeasible.
- b. Assumptions Based on Limited Data – One comment noted that too many assumptions were made due to the limited amount of information or limited number of similar sources. As part of the BACT analysis, similar sources in the United States are reviewed to determine what controls are “available,” meaning they used in practice at a commercial level. The most comparable facilities found were CARBO Ceramics. As discussed in the preliminary determination, the two CARBO facilities in Georgia have no emission controls for nitrogen oxides on their kilns. PyraMax proposed to use a catalytic baghouse to control nitrogen oxides, sulfur oxides, particulate matter, hydrogen chloride and hydrogen fluoride on the kilns. This baghouse will result in a nitrogen oxide emission limit of 36.3 pounds per hour or better as compared to the facilities in Georgia that have emission limits of 121 pounds per hour (CARBO Toombsboro) and 82 pounds per hour (CARBO McIntyre). This is a reduction of 84.7 and 45.7 pounds per hour respectively from currently permitted facilities. The commenter did not supply any information on other similar sources or control technologies that should be considered in the BACT review.
- c. BACT Considered the Low End of the Control Efficiency – The commenter did not provide the section they were referring to in the comment. We will assume they were quoting from page 29 of the preliminary determination, which referred to the sulfur dioxide BACT determination for the kiln. The determination states, “Because there are only a few facilities similar to the proposed ceramic proppant facility that have been proposed or are in operation and because little experience with kiln FGD controls in such facilities is available, DHEC considers the low end of the control efficiency...” The remainder of that

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paragraph states, "...ranges to be more realistic." Vendor literature for the proposed catalytic baghouse indicated that sulfur dioxide control efficiencies of 90% was typical with up to 98% achieved in some applications. The vendor, with little experience on this particular gas stream for this type of control device could not reliably determine the greatest control effectiveness for this process. The applicant also reported that no documentation of a similar source using this control technology could be found. Due to the uncertainty in the control technology effectiveness in this application the Department believes it was appropriate to allow the use of the typical control efficiency of 90% when determining the BACT emission limit for SO₂. The BACT analysis also requires low sulfur clay for the process. This baghouse will result in a sulfur dioxide emission limit of 11.64 pounds per hour or better. This is a 22.61 pound per hour reduction from currently permitted similar facilities.

11. **DHEC Concerned with Only Out-of-Date Legal Standards.** The Department is committed to protecting the health and environment of all people in the State of South Carolina. NAAQS are reviewed every 5 years and updated as necessary so that concerns regarding the health of sensitive individuals and protection of welfare are incorporated into air quality standards. The PSD regulation requires large facilities to consider the impacts from other area sources as well as their own emissions in determining compliance with the NAAQS. The facility must take into account its maximum emissions and impacts from other sources when demonstrating compliance with the increment, an additional air quality "cap" to protect the air quality of the area. Because the Clean Air Act recognized that air quality protection and economic development must be in harmony, the BACT analysis allows for the consideration of costs in determining the feasibility of additional controls. The facility has demonstrated it can meet the requirements in the PSD regulation as well as other applicable State and Federal air quality regulations developed to be protective of health and the environment.

12. **Other Environmental Impacts** – There were several comments that the community should be informed about other environmental aspects of the proposed facility in addition to the air emissions. Whenever possible, the Bureaus of Air Quality, Water Quality and Land and Waste Management coordinate public participation efforts with permitting a facility. However, PyraMax has not filed for any other permits through SC DHEC at this time. We do expect that a stormwater construction permit, and possibly an industrial stormwater permit, may be required for this facility. It is the responsibility of the SC DHEC's Bureau of Water to review all water quality and discharge permit applications that may be required by the facility. While there is not typically a formal public notice process for these stormwater permits, SC DHEC is committed to notifying the Allendale community if we receive applications for this facility. Additionally, PyraMax has informed the Department that waste disposal options are currently being evaluated, and that the Appleton Landfill would be a possibility for some waste materials. It is the responsibility of the SC DHEC's Bureau of Land and Waste Management to review all waste disposal applications that may be required by the facility. SC DHEC also commits to notifying the Allendale community when we receive any additional waste disposal permit applications for this facility.

Although other permits may be required for this facility, those permits are not required for the issuance of an air construction permit. The Department's Environmental Protection Fees

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regulation and the Expedited Review Program establish time schedules for timely action on permit applications for construction permits. Therefore, the Department may not hold a permit application indefinitely when a facility has submitted all the required information and the Department has reviewed such information and complied with the regulatory requirements for public participation. In accordance with Section 48-1-100(A) of South Carolina Pollution Control Act, the Department must issue a permit if an applicant submits an application that meets all applicable Department standards.

13. **Greenhouse Gas Emissions** – A comment was made concerning the PyraMax carbon emissions contribution to global climate change and potential damage to human health in South Carolina. Climate change is a global problem. The EPA has stated that there are no specific greenhouse gas emission sources that can be pinpointed as the dominate contributors to the problem and “the global problem is much more the result of numerous and varied sources each of which emit what might seem to be smaller percentage amounts when compared to the total.” The EPA has not proposed or established a national ambient standard for greenhouse gases. However, PSD was established by Congress in the Clean Air Act to protect the environment; therefore applying Best Available Control Technology for GHG emissions to this facility is protective of human health and the environment. The EPA has emphasized energy efficiency as BACT for GHG sources. The BACT analysis for PyraMax concluded that energy efficient design, waste heat recovery and the use of a lower carbon fuel, natural gas was BACT. The waste heat recovery project is estimated to save over 10,000 tons per year of GHGs. The use of a catalytic baghouse over a separate control device for nitrogen oxides is estimated to save over 80,000 tons per year of GHGs. Natural gas emits fewer GHGs then fuel oil, wood or coal.
- a. **BACT Did Not Account for GHG Emissions Outside the Plant** – One commenter stated that GHG emissions that could be generated elsewhere as a result of the operation of the plant, such as traffic to and from the plant and potential emissions from the use of the final products (proppant ceramic beads) by the oil and natural gas industry, should be accounted for. The BACT analysis is specific to the emission source, such as the calciner kilns and the pelletizers. Because it is source specific, BACT does not take into account GHG emissions from any emission sources that may be generated outside the plant itself.
 - b. **Limited Information on Pelletizer Efficiency** – There was a comment that the Department made too many assumptions with limited data on this analysis. As part of the BACT analysis for GHGs, process designs that reduce GHG emissions should be considered. In the case of the pelletizer, there was no available information to determine which pelletizer type is more efficient, thereby reducing GHGs. The BACT analysis for the pelletizer did focus on design and work practice standards that would optimize the process and could reduce GHG emissions. BACT requires a waste heat recovery system (as discussed above) to preheat the combustion gas for the pelletizers and thus reduce the amount of natural gas used to heat the process. BACT requires energy efficient design and work practices that will include vendor requirements for installation, maintenance and operation and manufacturer updates to the purchased equipment; facility’s response to stack test results, visual observations, or change in any process variables such as throughput, raw materials etc.; and methods for minimizing emissions during start-up, shut-down and malfunctions, while

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continuing to meet BACT limits. Please refer to the PyraMax application pages 5-78 and 5-79 for a detailed discussion of the energy efficient design. Additionally, an emission limit was developed for the pelletizer operation. The facility must demonstrate compliance with this limit through stack tests, recordkeeping and reporting.

14. **Monitoring Process Control Equipment** – A comment was received concerning proper process control and monitoring. All of the potential emissions from the facility were reviewed to determine what level of control was required in order to comply with state and federal regulations. A Best Available Control Technology or Maximum Achievable Control Technology review, a step by step process, was followed to identify the required control device and/or control technology.

Specific permit requirements were included to test emissions from the control device stacks and to monitor the controls to insure compliance with the emission limits. Initial and periodic stack tests are required to demonstrate compliance with the emission limits. The Department’s stack testing regulation requires that the tests be conducted “while the source is operating at the maximum expected production rate or other production rate or operating parameter which would result in the highest emissions for the pollutants being tested.” In addition to stack tests, each control device will be monitored regularly to insure proper operation and efficiency.

As an example, the calcining kilns’ catalytic baghouses control particulate matter, nitrogen oxides, sulfur dioxides, hydrogen fluoride and hydrochloric acid. Each catalytic baghouse will be stack tested for pollutant emissions. The facility is required to install, calibrate, maintain, and operate a continuous opacity monitoring system (COMS) for measuring the opacity of emissions discharged to the atmosphere and record the output of the system. The opacity is measured continuously by the COMS. The permit requires the facility to monitor the flow of the sorbent and ammonia injection system during the stack test for and maintain that flow while operating to demonstrate compliance. If the facility desires to use less sorbent or less ammonia, PyraMax will be required to conduct a new stack test to demonstrate compliance with the emission limit using the new injection amount. Pressure drop readings will be recorded daily and pressure drop ranges will be established using manufacturer recommendations, stack test data, vendor certification, operational history and/or visual inspections. The permit contains emission limits, testing, control device monitoring, fuel sampling, recordkeeping and reporting to ensure the facility is meeting the emission limits.

VI. Summary of Changes to the Statement of Basis and Construction Permit

Changes to the Statement of Basis

1. Page 4 – Corrected BACT Limit for CO for Engine 1 thru 8, and E Gen 1 thru 8. The CO limits for the two engine types had been reversed. The change establishes the correct CO limits.

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2. Page 4 – The BACT Limit for PM for Engine 1 thru 8, E Gen 1 thru 8, Fire Pump should have included the PM limit in NSPS, subpart III. This PM limit was previously omitted and has been added.
3. Page 5 – While the Raw Material Handling and Storage had been identified in the Source Description, it had not been identified with a specific Equipment ID number. Equip ID 00-23-1000 was added to identify this process area, as it is subject to specific permit conditions.
4. Page 13 & 14 – An entry for Efficiency Removal % had been omitted for the catalytic baghouses. The efficiencies for these baghouses are actually established by the individual BACT determinations. An entry was added to reflect how the Efficiency Removal % was established.
5. Page 28 – For Standard 4 – Unit ID 01 had been omitted from the Standard 4 requirements. A separate entry was made for the Unit ID 01 silos and storage buildings, as the PM Allowable requirements for the two are different.
6. Page 34 – 40CFR 60, subpart III – Added 40 CFR 60.4202, paragraph (a)(2). This paragraph documents the source of the previously established emission limits for engines EG 1 – 8.
7. Page 37 – The courts lifted the stay of the effective date of the Boiler MACT after the permit was sent to public notice. The two boilers are now subject to the NESHAP MACT boiler standard. Added 40 CFR 63, subpart DDDDD place keeper language to document the requirements of this subpart.

Changes to the Draft Permit

1. Page 7 - While the Raw Material Handling and Storage had been identified in the Source Description, it had not been identified with a specific Equipment ID. Number. Equip ID 00-23-1000 was added to identify this process area, as it is subject to specific permit conditions.
2. Page 17 – Unit ID 01 had been omitted from the Standard 4 requirements. Added Unit ID 01 to the Regulated Pollutant section. A Standard 4, Section X requirement was added to Condition 5.B.1 to reflect the control required for the Raw Material Storage process.
3. Page 18 & 19– Condition 5.B.3 - Added Standard 4 emission limit for Unit ID 01, SB & Additive Silos. Removed PM₁₀ and PM_{2.5} from Regulated Pollutant column, as Standard 4 applies to PM.
4. Page 19, 21, & 22 – Conditions 5.B.4, 5.B.5, & 5.B.6 – PM₁₀ & PM_{2.5} had been omitted from the Regulated Pollutant column. PM₁₀ & PM_{2.5} were added to reflect the BACT requirement.
5. Page 24 – Condition 5.B.9 - Added BACT emission limit for PM. Under Monitoring / Record Keeping – Added engine certification requirement. These requirements are

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established by NSPS, subpart IIII, but had not originally been included in the PM BACT or this permit condition.

6. Page 27 – Condition 5.B.11 – The condition establishes the requirement for an operational range for parametric monitoring, but did not establish a time limit for when the range should be established. A requirement was added to establish the operational range for the ammonia injection rate during source testing.
7. Page 29 – Condition 5.B.13 – This condition had established a BACT emission limit only for NO_x. The BACT emission limit is for NO_x and NMHC combined. The condition was corrected to reflect the combined limit.
8. Page 31 – Condition 5.B.15 - The condition establishes the requirement for an operational range for parametric monitoring, but did not establish a time limit for when the range should be established. A requirement was added to establish the operational range for the sorbent injection rate during source testing.
9. Page 48 – Condition 5.C.1 – reworded final bullet point from “PyraMax has purchased sufficient property” to “PyraMax will maintain a boundary layer of vegetation/wetlands to minimize the amount of dust that is transported off-property.” The statement was modified because the original wording appeared to require the purchase of land and this was not the intent.
10. Page 51 – Condition 7.C.4 – Changed Regulated Pollutant/Standard from HAP/PSD-112(g) to Subpart DDDDD. Deleted condition language for 112(g) Case by Case MACT. Added place keeper language for 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants, Subparts A and Subpart DDDDD--National Emission Standards For Hazardous Air Pollutants For Industrial, Commercial, And Institutional Boilers And Process Heaters. The facility is now subject to the federal boiler MACT, so the 112(g) case by case review is not required.

Appendix A

Issued Construction Permit 0160-0023-CA