Illinois Environmental Protection Agency
Bureau of Air
September 2015

Responsiveness Summary for the Public Comment Period on the Issuance of a Construction Permit/PSD Approval for Mississippi Lime Company to Construct a Lime Plant in Prairie du Rocher, Illinois

Source Identification No.: 157863AAC
Application No.: 08100063

Table of Contents

DECISION

On September 28, 2015, the Illinois Environmental Protection Agency (Illinois EPA) Bureau of Air issued a Construction Permit/PSD Approval to Mississippi Lime Company to construct a new lime plant to be located at 7849 Bluff Road in Prairie du Rocher, Illinois. At the same time, the Illinois EPA issued this Responsiveness Summary to address questions submitted during the hearing and associated public comment period that was held on the proposed issuance of the permit.

BACKGROUND

Lime is manufactured in kilns by high-temperature roasting or "calcination" of limestone to convert calcium carbonate ($CaCO_3$) into lime or calcium oxide (CaO). Mississippi Lime's proposed lime plant would have two lime kilns. The kilns would be permitted to burn solid fuel, i.e., coal and petroleum coke. The limestone for the plant would come from an existing underground limestone mine located next to the plant or, alternatively, from an off-site location.

The Illinois EPA, Bureau of Air evaluates applications for permits for proposed sources of emissions. An air pollution control permit application must appropriately address compliance with applicable air pollution control laws and regulations before a permit can be issued. Following its initial technical review of Mississippi Lime's application, the Illinois EPA Bureau of Air made a preliminary determination that the application met the standards for issuance of a permit.

COMMENT PERIOD AND PUBLIC HEARING

Due to the public interest in the project, the Illinois EPA held a public comment period with a hearing before making a decision on the construction permit/PSD approval for the plant. Accordingly, after it completed its preliminary review of the application, the Illinois EPA prepared a draft of the construction permit it was proposing to issue. The public comment period opened with the publication of notices in the Belleville News Democrat on April 18, 2014 (The notice was again published in Belleville News Democrat on April 25 and May 2, 2014) and the Red Bud North County News on April 24, 2014. The notice was again published in Red Bud North County News on May 1 and 8, 2014. The public hearing was held on June 2, 2014 at the Prairie Du Rocher Elementary School to accept oral comments and answer questions about the proposed plant and the draft permit prepared by the Illinois EPA. The comment period closed on July 2, 2014.

Following the close of the public comment period, the Illinois EPA reviewed the public comments and conducted its final technical review of Mississippi Lime's application. This review led to a final determination by the Illinois EPA that the application for the construction permit/PSD Approval met the standards for issuance of a permit.

AVAILABILITY OF DOCUMENTS

Copies of the Construction Permit/PSD Approval issued to Mississippi Lime and this Responsiveness Summary are available by the following means:

1. On the Illinois Permit Database on the internet:

   http://www.epa.gov/reg5oair/permits/ilonline.html (find the documents under All Permit Records (sorted by name), Construction Permit Records).

2. By contacting the Illinois EPA:

   Bradley Frost, Community Relations Coordinator
   Illinois Environmental Protection Agency
   Office of Community Relations
   1021 North Grand Avenue, East
   P.O. Box 19506
   Springfield, Illinois 62794-9506

   888/372-1996 Toll Free – Environmental Helpline
   217/782-7027 – Desk Line
   217/782-9143 – TDD
   217/524-5023 – Facsimile
   brad.frost@illinois.gov

APPEAL PROVISIONS

The permit being issued grants approval to construct pursuant to the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. Accordingly, individuals who filed comments on the draft permit or participated in the public hearing may petition the U.S. Environmental Protection Agency (USEPA) to review the PSD provisions of the issued permit. In addition, any person who failed to file comments or failed to participate in the public hearing on the draft permit may petition for administrative review but only to the extent changes were made to the draft permit by the final permit decision.

As comments were submitted on the draft permit for the proposed source that requested a change in the draft permit, the issued permit does not become effective until after the period for filing of an appeal has passed. This letter is the service of notice that a final permit decision has been made. The procedures governing appeals of PSD permits are contained in the Code of Federal Regulations (CFR), "Appeal of RCRA, UIC and PSD permits," 40 CFR 124.19. If an appeal request will be submitted to USEPA by a means other than regular mail, refer to the Environmental Appeals Board website at http://www.epa.gov/eab/ (look under the link for Frequently Asked Questions for instructions). If an appeal request will be filed by regular mail, it should be sent on a timely basis to the following address:

U.S. Environmental Protection Agency
Clerk of the Board
Environmental Appeals Board (MC 1103B)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460-0001
Telephone: 202/233-0122

COMMENTS AND QUESTIONS

1. I am alarmed that the Illinois EPA would even consider permitting a plant that would burn coal and petroleum coke so near a community and the Nature Preserve.

   The air quality analyses conducted for the proposed plant show that it would not threaten either the public or natural resources.

2. I am extremely concerned about the potential impacts of the proposed plant on nonattainment of air quality standards in the Metro-East area.

   The emissions of the proposed plant would not interfere with ongoing work to bring the Greater St. Louis Area into attainment with the National Ambient Air Quality Standard for ozone or to improve air quality for particulate.

3. I have recently learned that the Missouri Department of Natural Resources has expressed concerns about the modeling employed for this application and its potential impacts on one of Missouri's SO_2 nonattainment areas.

   The SO_2 emissions of the proposed plant should not affect Missouri's plans to bring the SO_2 nonattainment area in Jefferson County, Missouri, into attainment. SO_2 emissions from a source that has now been shutdown, a lead smelter, were a key contributor to the high hourly ambient concentrations of SO_2 in certain portions of Jefferson County.

4. I have not had the opportunity to review the proposed permit. I therefore request a 30-day extension of the public comment period so that I can more adequately prepare informed comment.

   As required by 35 IAC Parts 252 and 254, a 75 day period was provided for the public to review and submit comments on the proposed issuance of a revised permit for the proposed plant. It is not appropriate to extend the comment period based on this request.

5. Who did the modeling for Mississippi Lime? Was it audited by the Illinois EPA? I request that additional independent modeling be performed by another consulting firm to be hired by the Illinois EPA, with Mississippi Lime required to pay the cost. If there is a discrepancy, public comment should reopen and US Fish and Wildlife be informed and allowed to reconsider potential impacts to the Wilderness Area at the Mingo Wildlife Refuge. I fear that its approval may have been based on faulty information.

   The modeling for the proposed plant was conducted by Shell Engineering, supplemented by certain analyses conducted by the Illinois EPA to respond to comments from USEPA. The modeling that was conducted by Shell Engineering was appropriately reviewed by the Illinois EPA. This is the standard approach to air quality analyses for PSD applications, as supported by the PSD rules. It is appropriate to generally place the burden for preparing the analyses to support a proposed project that is subject to PSD on the applicant, rather than on the permitting authority. It maintains the role of the Illinois EPA as an independent body reviewing the applicant's submittal and keeps the Illinois EPA from being responsible for supporting the application.

6. Has the Illinois Department of Natural Resources (IDNR) been informed about the potential impacts to Fults Nature Preserve? It should be allowed to review the application and new modeling and given time to comment on the impacts to the Nature Preserve.

IDNR was informed about potential impacts to the Fults Nature Preserve, as well as other natural resources in the vicinity of the proposed plant site. To respond to concerns expressed by IDNR about the impacts of the project, Mississippi Lime had a supplement prepared to the ecological risk assessment for the proposed plant.[1] This analysis shows that the emissions of the proposed plant would not threaten natural resources.

7. Petroleum coke contains more sulfur than coal. Is there a scrubber? A high-efficiency scrubber should be required for control of SO_2.

"Add-on" scrubbers systems would not be required to be used for control the SO_2 emissions of the proposed kilns. SO_2 emissions would be controlled by the "natural" scrubbing actions of the limestone and lime dust entrained in the flue gas from the kilns, which dust is then collected by the baghouses on the kilns. For lime kilns that process high-calcium limestone, this natural scrubbing is very effective at controlling SO_2 emissions, essentially functioning as a scrubber system. For the proposed plant, the required efficiency is comparable to the required efficiencies of scrubbers installed on coal-fired power plants and other new emission units with significant emissions of SO_2.

8. There are children in Prairie du Rocher who would be impacted by the emissions from the proposed plant. They could end up like so many children in urban areas, with asthma and dependent on medicine and inhalers.

The various air quality analyses submitted with the application show that the plant should not pose a threat to public health. In particular, the air quality would continue to comply with the National Ambient Air Quality Standards (NAAQS), standards for air quality set by USEPA to protect public health and welfare.

It must be recognized that asthma is a serious respiratory disease whose causes are still being studied. Asthma is not limited to individuals who live in urban areas. Individuals who have asthma need to be under a doctor's care. These individuals and their families need to be aware of the conditions that trigger their asthmatic attacks and take appropriate measures to avoid these conditions, to reduce asthmatic sensitivity and to correctly respond when attacks occur.

9. What would be the impacts to local agricultural crops, especially, organic farming? The impacts would be significantly lower if natural gas were used rather than coal and petroleum coke.

The impacts of the plant's emissions on crops and soils have been addressed to confirm that air quality would continue to be within levels that protect agriculture in the area.

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1. **AECOM, "Ecological Risk Assessment Screening Evaluation: Addendum – State-Listed Endangered Species," Aril 21, 2015, received by the Illinois EPA, April 30, 2015.**

10. I am concerned about how the petroleum coke will be stored. Will it be stored in a closed facility? What fugitive dust controls are planned? I understand greater restrictions are being put on facilities upstate with regard to petroleum coke. People deserve the same protection down here. Mississippi Lime should be required to use the same controls as the transfer companies in the Chicago area. Better yet, it should be required to switch to natural gas.

The emissions control requirements for the storage of petroleum coke at the proposed plant are appropriate. Unlike the "transfer facilities" for petroleum coke referred to in this comment, the proposed plant would handle a relatively small amount of petroleum coke for use at the facility. The plant would also not be located in a densely populated urban area, which is home to both neighborhoods and other industrial facilities.

11. I am also troubled that petroleum coke will sit in the American Bottom floodplain of the Mississippi River. River levels are higher and higher. According to recent scientific reports on climate change, river levels will continue to rise. The levee protecting Prairie du Rocher is vulnerable; it could break and the petroleum coke and coal piles mixed with the water, threatening the community.

The concern raised in this comment is outside the scope of this air pollution control permit. However, the proposed facility, including the areas for storage of petroleum coke and coal, must be appropriately designed to be protected against flooding. This aspect of the design of the proposed plant will take into consideration the plant's location and the history of flooding along the Mississippi River.

12. Mississippi Lime first applied for a permit for this plant several years ago. At the first public hearing, I asked why it could not use natural gas instead of petroleum coke and coal. I was told it was because of the expense. Natural gas is so very much cheaper now, yet the proposed fuel remains the same. This is all the more abhorrent in view of what I have learned since then about petroleum coke and in light of the proliferation of more intense weather events due to climate change.

The use of natural gas was considered as a means to reduce emissions of the plant and was rejected. This is because of the negative effects it would have for emissions of nitrogen oxides (NO_x), the limited benefits for emissions of pollutants that would be reduced, and the cost of this alternative. Use of natural gas would actually be expected to increase the plant's emissions of NO_x, because of how gaseous fuel burns in a lime kiln. In addition to nitrogen dioxide (NO_2) being an air pollutant, NO_x is a precursor pollutant that contribute to formation of both ozone and fine particulate matter ($PM_{2.5}$) in the atmosphere. At the same time, use of natural gas would have a limited effect on the emissions of sulfur dioxide (SO_2) from the plant. This is because the SO_2 emissions from the plant would be well-controlled by the natural scrubbing action of limestone and lime in the flue gas from the kilns before this dust is collected in the baghouses. The particulate emissions from the ash in the solid fuel are also very well controlled by the baghouses on the kilns, which must be present in any case to control the limestone and lime dust from the kilns.

13. The Illinois EPA should require Mississippi Lime to resubmit an application based on natural gas as a fuel.

As discussed, the use of natural gas as a fuel for the kiln was appropriately rejected due to its associated environmental and economic impacts. This comment does not demonstrate that the proposed kilns should be required to use of natural gas.

14. I thought the height of irony was the Illinois EPA holding the second public hearing for this project on the very day the USEPA announced its proposed regulation of CO_2. Why would Illinois EPA in 2014, four years after the initial permit was remanded, even consider permitting any facility to burn petroleum coke and coal, especially in view of the USEPA's proposed limits on CO_2? Such a decision would not only contribute further to our CO_2 emissions, but would surely impact existing facilities in Illinois. It would not be fair to them.

This comment reflects a short-sighted view of the proposed plant. Lime is a valuable and important commodity. Among other things, it is used to control air pollution and water pollution. The proposed plant will produce lime using new modern kilns that are energy efficient. Not only will their CO_2 emissions be lower than those of older kilns, which are not as energy efficient, but their emissions of other pollutants will also be lower.

The circumstances are similar to those from coal-fired power plants, which are the subject of the USEPA rulemaking mentioned in this comment. In addition, for coal-fired power plants, it is important to recognize that energy conservation by consumers, i.e., measures that reduce electricity usage, are also an essential way to reduce CO_2 emissions from generation of electricity.

15. The Illinois EPA should reject this application.

The application for the proposed plant meets the standards for issuance of an air pollution control construction permit. The comments that have been submitted have resulted in various enhancements to the permit for the plant, as well as additional analyses to address the impacts of the plant. However, the comments have not shown that a construction permit should not be issued for the proposed plant.

16. The permit record does not appear to include any air quality analysis to show that this project will not cause a violation of the National Ambient Air Quality Standard (NAAQS) for ozone as required by 40 CFR 52.21(k) and (m). USEP's Phase 2 Rules for implementation of the 8-hour ozone NAAQS (70 FR 71612, November 29, 2005) provide that NO_x must be considered a precursor under PSD. One of the elements of the Phase 2 rulemaking was changes to PSD so that emissions of 40 tons per year or more of NO_x would be "significant" for ozone. *See* 40 CFR 52.21(b)(1)(ii), (2)(ii) and (23)(i). In accordance with 40 CFR 52.21 (m)(1)(a), a PSD permit application must contain an air quality analysis for each pollutant that a proposed major project would have the potential to emit in significant amounts. Since the NO_x emissions of the proposed plant are above the significant emission rate for ozone, the PSD rules require that the record contain an ozone impact analysis for this source. USEPA does not have a specific recommendation at this time on how to conduct a source-specific ozone analysis as the extent of the

analysis would be dependent on an evaluation of additional source-specific facts. Types of analyses range from qualitative information to quantitative photochemical modeling of single sources. Given the substantial amount of NO_x emissions in this case, a more quantitative analysis may be justified. The Illinois EPA should consult with USEPA Region 5 regarding the appropriate form for such an analysis in this case. *See* 40 CFR Part 51, Appendix W, Section 5.2.1.c.

The Illinois EPA has prepared an analysis of the impacts of the proposed plant on ozone air quality. This analysis was prepared in consultation with appropriate staff at USEPA Region V. It shows that the proposed project would not cause an exceedance of the current ozone air quality standard and the design values in the region for ozone air quality would be essentially unchanged.

17. The analysis in the record examining the impacts of NO_x and SO_2 emissions on secondary $PM_{2.5}$ is inadequate. USEPA's *"Guidance for $PM_{2.5}$ Permit Modeling,"* May 20, 2014, provides information, and specific examples regarding the types of analyses that could be conducted for various emission scenarios. Given the amount of NO_x emissions in this case, a more quantitative analysis may be justified. The Illinois EPA should consult with USEPA Region 5 regarding an appropriate secondary analysis for $PM_{2.5}$. *See* 40 CFR Part 51, Appendix W, Section 5.2.2.1.c.

The Illinois EPA has prepared an analysis of the impacts of the NO_x emissions of the proposed plant on $PM_{2.5}$ air quality as a result of formation of secondary $PM_{2.5}$, as will occur in the atmosphere over time. This analysis was prepared in consultation with appropriate staff at USEPA Region V. This further analysis also shows that the proposed project would not cause an exceedance of the NAAQS for $PM_{2.5}$.

18. I have concerns with the determination of Best Available Control Technology (BACT) for greenhouse gases (GHG) in Draft Condition 2.1.2(b)(iii)(A). Draft Conditions 2.1.11(a)(i) and (iii) would provide that the GHG emission limit for the affected kilns in Condition 2.1.2(b)(iii)(A) (i.e., 2,744 pounds of GHG, as carbon dioxide equivalents (CO_2e) per ton of lime produced by the kiln) "shall be lowered based on actual operation and emissions of the kilns unless the Permittee demonstrates and the Illinois EPA concurs ... that a lower limit cannot be reliably met without unacceptable consequences, i.e., inability to comply with other emission limits or requirements or significant risk to equipment or personnel, and without unreasonable consequences, i.e., a significant increase in maintenance and repair needed for the kilns." Draft Condition 2.1.11(a)(ii) would provide that the GHG BACT "shall automatically be lowered" to 2,630 pounds of CO_2e per ton of lime if the Permittee fails to conduct the required evaluation or does not complete the evaluation in a timely manner. Pursuant to Draft Condition 2.1.11(b), if the Permittee elects to perform an evaluation for GHG emissions, the evaluation would need to be completed within four years (extendable by an additional two years) after the initial startup of a kiln.[2] Draft Condition 2.1.11(a)(iii)

[2] **The Project Summary apparently reflects an earlier version of Draft Condition 2.1.11(b) as the Project Summary indicates that "The duration of the demonstration period would be five years from the date of initial startup of a kiln, with provision for an additional year if needed to effectively set a revised BACT limit for GHG."**

would further provide that if the GHG BACT limit must be revised based on the evaluation, the revision would be performed through a permit revision.

One concern with these provisions is that the draft conditions requiring an evaluation period and potentially a permit revision suggest that the Illinois EPA is not convinced that the proposed limit of 2,744 pounds per ton represents BACT for the proposed lime kilns for GHG. As USEPA has previously observed, a BACT reevaluation is appropriate if it can be determined that errors, faulty data, or incorrect assumptions contained in the original BACT analysis resulted in what may be inappropriate BACT emission levels, and there is no indication that the applicant intentionally acted to misrepresent or conceal data in their original permit application.[3] In this case, the Illinois EPA justifies the evaluation period by pointing to "the dearth of data that is available for the GHG emissions of lime kilns." Project Summary, p. 66.[4] As a result, the Illinois EPA relied upon generic data for lime manufacturing plants when developing the GHG BACT limit, which resulted in the uncertainty with the proposed BACT limit. However, I note that it appears that the Illinois EPA did not consider GHG BACT limits in permits for lime kilns in other states. I recommend that the Illinois EPA review and evaluate other permitting actions to validate that the proposed 2,744 lbs/ton limit represents BACT.

As discussed in the Project Summary, because GHG are newly regulated under the PSD rules, there is not a body of historical data for the GHG emissions of individual lime kilns, including both permits with BACT determinations for GHG and actual emission data for GHG.[5,6] As such, the BACT determination for the proposed lime kilns appropriately relies on "bench mark data," which has been assembled for the lime industry as a whole and provides insight on the range of energy efficiency and GHG emissions across an industry.

19. Given the Illinois EPA's uncertainty with the BACT limit due to insufficient emission information, I recommend that the evaluation period not be optional. As stated in the USEPA memorandum referenced above concerning a project involving Ogden Martin, a BACT re-evaluation is necessary if errors, faulty data, or incorrect assumptions contained

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Project Summary, p. 66. The draft permit still provides for an evaluation period that is up to six years in duration with the approval of the Illinois EPA.

[3] The Project Summary states several reasons why the Illinois EPA could not obtain actual GHG emissions data, including business confidentiality and the fact that the mandatory GHG reporting rule does not require production data to be reported.

[4] *See* Memorandum from Gary McCutchen and Michael Trutna to J. David Sullivan, "Request for Determination on Best Available Control Technology Issues -- Ogden Martin Tulsa Municipal Waste Incinerator Facility," November 19, 1987.

[5] In particular, at this time, there is only a single entry in the USEPA RACT/BACT/LAER Clearinghouse for the GHG emissions of a lime kiln. It addresses two new vertical lime kilns proposed by Jacksonville Lime at a plant in Jacksonville Florida. As that project involves vertical lime kilns, it cannot be relied upon as BACT for GHG emissions of the rotary lime kilns proposed by Mississippi Lime.

[6] The construction permit issued in November 2013 by the Oklahoma Department of Environmental Quality to U.S. Lime Company for a new kiln at its facility in Marble City, Oklahoma (Permit No. 2008-284-C (M-1)(PSD), can also not be relied upon. This is because this project relied on netting to not be a major modification under the PSD program and involves replacement of a small vertical kiln with another vertical kiln.

in the original BACT analysis may have resulted in what may be inappropriate BACT limits.

Upon further consideration in response to this comment, in the issued permit, the evaluation period followed by possible downward adjustment of this BACT limit, to increase the stringency of this limit, is now mandatory. The issue that is effectively posed by this comment is whether data is available for the GHG emissions of lime kilns that shows that a limit lower than the default value in Draft Condition 2.1.11(a)(ii) will not be achievable. While it is very unlikely that such a lower limit will be achievable, the available data is not sufficient to make such a showing. Accordingly, the issued permit provides for the possibility that an even lower GHG emission limit is achievable. The issued permit no longer includes a default value for the GHG emission rate of the kilns. In the absence of any default values, the evaluation by Mississippi Lime of the GHG emission rate that is achievable by the kilns must necessarily become mandatory.[7]

20. In the Project Summary, the Illinois EPA suggests that it would be "unrealistic" to expect the proposed kilns to achieve a limit lower than 2,630 lbs/ton (Project Summary, p. 66) but this suggestion does not appear to be supported by actual emissions data or engineering analysis. The permit should not limit the BACT revision to 2,630 lbs CO_2e/ton if the Permittee does not complete the evaluation in a timely manner, since the results of the evaluation may reveal that a lower emission limit is achievable.

As already discussed, the issued permit would not restrict the downward adjustment of the BACT limit to the default value for the GHG emission rate specified in Draft Condition 2.1.11(a)(ii). This is because the issued permit would make the evaluation of the GHG emission rate that is achievable by the facility mandatory. As a consequence, the magnitude of any downward adjustment that results from this evaluation cannot be restricted by the permit since any such adjustment must consider the results of this evaluation.[8]

21. The Draft Permit would not specify how the source will calculate GHG emissions based on the CO_2 data collected by the Continuous Emissions Monitoring Systems (CEMS) for CO_2. Draft Condition 2.1.8-1 would require the source to install, calibrate, maintain and operate a CEMS on each affected kiln for CO_2 emissions. However, the Draft Permit would not specify how GHG emissions would be calculated based on the CO_2 CEMS data. Because GHG is a mixture of six pollutants, including methane and nitrous oxide, the permit should specify how the source will calculate GHG emissions as CO_2e. Draft Condition 2.1.9(g) would simply requires the source to maintain records of emissions of GHG, as CO_2e) (tons/month and tons/year) without specifying how the source must calculate those

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[7] As this evaluation would now be mandatory, the issued permit also requires Mississippi Lime to submit annual progress reports for this evaluation. This is because this evaluation is now a prerequisite to the adjustment of the BACT limit. Progress reports are appropriate to facilitate review by the Illinois EPA and other interested parties of the data that is being collected while the evaluation is underway.

[8] An "automatic adjustment" to the BACT limit, as would have been provided by the draft permit, would generally only be appropriate in circumstances in which such an adjustment is provided for as an alternative to conducting an evaluation. In re Prairie State Generating Company, 13 E.A.D. 3 (EAB 2006).

emissions. Options for calculating such emissions include the use of Equation C-8 of 40 CFR 98.33(c)(1), data from source tests or other methodology as specified in the permit, consistent with the emission calculations used in the application.

In response to this comment, changes have been made in the issued permit to clarify the required approach to the determination of GHG emissions from the kilns. The issued permit explicitly provides that GHG emissions including CO_2 emissions, shall be determined using appropriate methodology under 40 CFR Part 98 Subpart S. As suggested by this comment, as it refers to 40 CFR 98.33, USEPA's rules at 40 CFR Part 98 Subpart S lays out appropriate methodology for the determination of the GHG emissions of the lime kilns considering both GHG emissions from the calcination of limestone and from combustion of fuel.[9]

22. The potential emissions of the emergency generators as addressed in Draft Condition 1.1(a) and Attachment 1 are incorrect because they do not address emissions during power outages. The Project Summary explains that the emissions "during actual power outages" are not addressed because the kilns "*would not be operating during such periods and the overall emissions of the plant during such periods will be far less than when the kilns are in operation.*" Project Summary, p. 87. However, the potential emissions for purposes of BACT and air quality analyses must account for the overall permitted operation of the unit. USEPA guidance suggests that 500 hours of operation per year may be used to determine the potential emissions of an emergency generator unless another enforceable restriction is included in the permit.[10] In the case of the draft permit, there is no practically enforceable restriction on the potential emissions of the emergency generators.[11] Similarly, the BACT analysis submitted by Mississippi Lime for the emergency generators assumes that each emergency generator will operate for no more than 100 hours per year but does not account for emergency operation.[12] Please ensure that the BACT limits, other emission limits, and the air quality analyses for the project account for all permitted modes of operation for the emergency generators.

The potential emissions of the emergency engine generators are limited. Condition 1.4-2(a)(ii) requires that these engines be used as emergency engines. As discussed in this comment, it is appropriate to consider the potential emissions of the emergency engines, considering both exercise of the engines and actual operation of the engines for emergencies, to be 500 hours per year. This is the approach to

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[9] For emissions of CH_4 and N_2O, as area generally attributable to the combustion of fuel in a lime kiln, 40 CFR 98 Subpart S refers to 40 CFR 98 Subpart C, which generally addresses reporting of GHG emissions from stationary fuel combustion emission units.

[10] *See* Memorandum from John S. Seitz, USEPA, Director of Air Quality Planning and Standards, to USEPA Regional Offices, *Calculating Potential to Emit (PTE) for Emergency Generators*, September 6, 1995.

[11] Draft Condition 1.4-2(a)(iii)(A) limits operation of each engine to no more than 100 hours per calendar year "to confirm availability for emergency operation." Additionally, Attachment 1 to the Draft Permit states: "Limits only address emissions during the operational testing of [the emergency generators] to verify availability in the event of a power outage. Limits do not address emissions during power outages, when the kilns would not be operating."

[12] *See* "BACT Analysis for Emergency Generators," Mississippi Lime Company, August 21, 2013.

potential emissions that is reflected in the USEPA guidance cited by this comment. In fact, as the permit for the plant restricts the exercise of the engines to no more than 100 hours per year, the permit establishes an additional restriction on the operation of the engines, further constraining their operation and emissions. The BACT analysis for the engines was properly conducted based on these restrictions. As discussed elsewhere, the air quality analyses for the proposed plant were also properly conducted. Given the infrequent and uncertain timing of the use of the engines, it was not feasible to address the uncertain impacts of these engines, if any, in these analyses.[13]

The fact that separate limits are not set in Attachment 1 for the emissions of the emergency generators during power outages does not change these circumstances. As generally discussed in the Project Summary, those emissions are addressed and limited with the emissions of the kilns. This is because the kilns cannot operate during power outages because these generators will not be large enough to supply enough power to keep the plant running during a power outage. The narrow role of these emergency generators is to keep the kilns slowly rotating during power outages to prevent damage to the kilns and their refractory as they cool. The fact that Attachment 1 addresses the emissions of the emergency generators during power outages with the emissions of the kilns has been clarified in the issued permit, with further explanation in Note 2 of this attachment.

23. The draft permit would not specify how the source will calculate emissions of "total particulate matter$_{2.5}$" ($PM_{2.5}$), including both filterable and condensable particulate. The draft permit would include emission limits for total $PM_{2.5}$ and total PM_{10} but the permit would not specify how total $PM_{2.5}$ is to be determined. Draft Condition 3.1 (b)(i) would require the source to test for PM (filterable), PM_{10} (filterable), $PM_{2.5}$ (filterable) and PM (condensable). In addition, Draft Condition 3.1(b)(ii) specifies that PM_{10} tests shall include measurements of condensable PM. I assume that total PM_{10} will be determined as the sum of filterable PM_{10} and condensable particulate. However, it is not clear if total $PM_{2.5}$ will be determined as the sum of filterable $PM_{2.5}$ and condensable particulate or if a conversion factor will be applied to the measurement of condensable particulate to arrive at an equivalent value of condensable $PM_{2.5}$.

Both total PM_{10} and total $PM_{2.5}$ are to be determined as the sum of the measured filterable emissions of particulate (either PM_{10} or $PM_{2.5}$, as applicable) and the measured condensable particulate. The permit does not provide for use of a conversion factor to develop an adjusted, smaller value of condensable particulate for the determination of total $PM_{2.5}$, as speculated upon in this comment. The use of such a procedure

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[13] As related to the approach to modeling of intermittent emission units, USEPA concluded in its guidance for air quality analyses for the 1-hour NO_2 NAAQS that,

> **For the reasons discussed above, EPA believes the most appropriate data to use for compliance demonstration for the 1-hour NO_2 NAAQS are those based on emission scenarios that are continuous enough or frequent enough to contribute significantly to the annual distribution of daily maximum 1-hour concentrations.**

USEPA Memorandum of March 1, 2011, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard.

would not be technically justified. This is because all condensable particulate is expected to be formed in the atmosphere as fine particulate, i.e., particulate with an aerodynamic diameter of 2.5 microns or less. This is standard practice as reflected in USEPA policy and codified by the applicable USEPA test method for emissions of condensable particulate (USEPA Method 202).

24. The monitoring requirements for $PM_{2.5}$, PM_{10}, sulfuric acid, methane (CH_4), nitrous oxide (N_2O) and metals appear to be inadequate to assure continuous compliance with the emission limits. Draft Condition 2.1.7 would require the source to conduct initial performance tests on each kiln (within one year) for a number of pollutants including PM, PM_{10}, $PM_{2.5}$, sulfuric acid mist, CH_4, N_2O and metals. Among other information, the performance tests will be used to develop emission factors for the kiln. *See* Draft Condition 2.1.7(d)(ii). Additionally, Draft Condition 2.1.8-1 would require the source to install, calibrate, maintain and operate CEMS on each kiln for SO_2, NO_x, CO and CO_2. Additional PM testing is required within five years following the initial PM test and within five years following each subsequent test thereafter. However, the Draft Permit would not require subsequent testing for emissions of other pollutants that are not monitored by CEMS including PM_{10}, $PM_{2.5}$, sulfuric acid mist, CH_4, N_2O and metals. Please add periodic testing requirements for PM, PM_{10}, $PM_{2.5}$, (including condensable particulate), sulfuric acid mist, CH_4, N_2O and metals or explain how the permit conditions will otherwise assure continuous compliance without periodic testing for these pollutants.

In response to this comment, the issued permit addresses periodic emission testing for the kilns. New Condition 2.1.7(a)(ii)(B) requires testing to be conducted for the subject pollutants at least every five years unless otherwise provided by the Clean Air Act Permit Program (CAAPP) permit for the source. As this testing will address emissions of pollutants from the kilns other than SO_2, NO_x, CO and CO_2, more frequent testing is not needed.[14] This is because emission levels should be maintained as part of the normal operating and maintenance practices for the kilns. In addition, if the initial emission testing indicates levels of emissions that warrant more frequent testing, Mississippi Lime must conduct such testing as directed by the Illinois EPA.[15] As part of the process of issuing a CAAPP permit for the source, the ongoing frequency for periodic testing should be evaluated as part of the evaluation of appropriate periodic monitoring for the source.[16]

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[14] Continuous emission monitoring is required for NO_x and CO. This monitoring will address proper operation of the combustion system of the kilns and the SNCR control system to assure compliance with the emission limits for NO_x and CO.

[15] Condition 2.1.7(a)(iii) provides that, in addition to the emission testing specified by the permit, Mississippi Lime shall have testing performed for the kilns as requested by the Illinois EPA within 90 days of a written request by the Illinois EPA or such later date agreed to by the Illinois EPA.

[16] In addition, during the processing of the application for an operating permit for the facility under Illinois' Clean Air Act Permit Program (CAAPP), the Illinois EPA will need to reassess the appropriate frequency for periodic emission testing for the kilns. This is because a CAAPP permit must require appropriate Periodic Monitoring, which among other things, may include requirements for emission testing, to assure compliance with the various air pollution control requirements that apply to the emission units at a source.

25. The Illinois EPA's Supplemental Project Summary for an Application for a Construction Approval/PSD Approval for a Lime Manufacturing Plant near Prairie du Rocher (Project Summary) states that AERMOD version 12060 and AERMET version 11059 were used for the modeling analysis. This is true for updated SO_2 modeling described in a July 2012 submittal on behalf of Mississippi Lime. However, versions 12345 of AERMOD and AERMET were used in the updated PM_{10} and $PM_{2.5}$ modeling analysis described in a December 2013 submittal on behalf of Mississippi Lime. Considering how close the modeled concentrations are to exceeding the NAAQS and PSD Increments, this is a severe deficiency in the application, and AERMET and AERMOD must be rerun using the latest versions available (13350) at the time that the draft permit was issued for public comment to ensure that modeled violations are not being disregarded.

The project was modeled using the most current versions of AERMOD System (AERMOD) available from USEPA at the time of submission. Subsequent versions of the modeling components have included only minor changes that should not affect the outcome for this project.[17] Furthermore, this comment does not show that the newer versions of the model would change the outcome of the analysis for the proposed facility. Modeling using the version of AERMOD that was available at the time the application was submitted does not present a deficiency in the analysis given the minor differences between the versions of the models.

26. Neither the Project Summary nor the recent submittals of revised dispersion modeling analyses by Mississippi Lime contain a discussion as to why surface meteorological data collected by the National Weather Service at Lambert - St. Louis Airport is representative of meteorological conditions expected in the vicinity of the proposed facility. Justification for the selection of representative meteorological data for use in the modeling analysis is required in accordance with Section 8.3 of the Guideline on Air Quality Models (40 CFR 51 Appendix W) and Section 3 of USEPA's AERMOD Implementation Guide. This requirement is particularly critical in a location characterized by local terrain influences, such as the proposed site for the facility, and for an analysis in which the surface meteorological data used as representative of the project site were gathered at a location over 75 kilometers from the project site.

Meteorological data collected at Lambert – St. Louis Airport was used in the air quality analysis for the project because it is the closest first order weather station operated by the National Weather Service. First-order weather stations provide very reliable, professionally gathered weather data. They also provide data to address the statistically based annual NAAQS. The five years of hour-by-hour meteorology used in the modeling cover all meteorological conditions experienced in the region. It is an appropriate choice for meteorological data because the range of meteorology over a five year period for Prairie du Rocher is similar to

[17] The new versions correct minor errors in the computer code that were not relevant for the analyses for this project. For example, changes were made to eliminate certain inadvertent fatal warnings and double counting of background under certain conditions. The new versions also add various enhancements to the feature of this model, such as non-regulatory options and changes in the available content of reports, Refer to "Model Change Bulletin 9 for AERMOD 13350," available at http://www.epa.gov/ttn/scram/models/aermod/aermod-mcb9.txt.

that found elsewhere in the region, including in St. Louis, Missouri. In this regard, both Prairie du Rocher and St. Louis are located in a region without elevated terrain so that terrain is a factor in their meteorology.

27. No analysis is presented in the PM_{10} and $PM_{2.5}$ dispersion modeling submitted by Mississippi Lime demonstrating that maximum ambient concentrations are predicted to occur with the kilns operating at 100 percent load. As specified in Section 8.1.2 of Guideline on Air Quality Models (40 CFR 51 Appendix W), it is possible that model-predicted ambient concentrations occur at reduced load conditions due to differing stack release parameters resulting in decreased dispersion at loads less than 100 percent. For example, Draft Conditions 2.1.3-2(b)(ii) and 2.1.6(a) indicate that when the kiln is operating at 30 percent or less capacity the same short-term emission rate limit for PM_{10} and $PM_{2.5}$ applies as when the kiln is operating at full load. However, the stack velocity would be significantly lower when the kiln is operating at 30 percent load than full load and thus it is expected that the worst-case load condition for the purposes of the air quality analysis for $PM_{2.5}$ and PM_{10} would be when the kiln system is operating at less than 30 percent of capacity. Mississippi Lime should be required to conduct a low-load analysis to demonstrate that maximum expected concentrations have been adequately defined for review by Illinois EPA and the public (Illinois EPA, Prevention of Significant Deterioration, The Art and Science of the PSD Air Quality Analysis The Modeling Perspective, Section III. Preliminary Impact Analysis, C. Reduced load analysis, February 27, 2014).

This comment overstates the recommendation made by USEPA in its Guideline on Air Quality Models. This recommendation addresses the normal operation of emission units and not the transient conditions that are present during startup of emission units. The modeling for PM_{10} and $PM_{2.5}$ was appropriately conducted to address operation at the design capacity of the kilns since the kilns will operate in this range.

The fact that the additional modeling for NO_x and SO_2 was conducted for the startup of the kilns does not show that such modeling is needed for PM_{10} and $PM_{2.5}$. This additional modeling was required by the Illinois EPA to assure that the kilns would not threaten the hourly NAAQS for NO_x and SO_2 during startup.[18] This concern is not present for PM_{10} and $PM_{2.5}$. This is because the short-term NAAQS for PM_{10} and $PM_{2.5}$ apply on a 24-hour average. In addition, the PM_{10} and $PM_{2.5}$ emissions of a kiln, in pounds/hour, will be a fraction of the emissions that are present when a

[18] During the development of the modeling protocol for the proposed plant, the Illinois EPA indicated, "Start-up mode modeling should be included as a separate modeling scenario, separate from the standard reduced load analysis. This would be for lower loads briefly occurring during start-up. Modeling should be done for pollutants with short averaging times of 1 to 3 hours like CO and SO_2." Illinois EPA, *Prevention of Significant Deterioration: The Art and Science of the PSD Air Quality Analysis - The Modeling Perspective*, Draft, Section III. Preliminary Impact Analysis, C. Reduced load analysis, Item 2, "Start-up modeling," August 21, 2007.

Accordingly, modeling was conducted for start-up of the kilns to address the 1-hour NAAQS for NO_x and SO_2, as well as the 1-hour NAAQS for CO.

kiln is operating at its design capacity. This is because the baghouse will provide an equal if not better level of performance in terms of the outlet dust loading from the kiln in gr/dscf.[19]

28. Emissions from diesel-fired emergency engines at the proposed plant have not been included in the SO_2, PM_{10} and $PM_{2.5}$ modeling analyses for Significant Impacts, NAAQS, and PSD Increments. These engines will emit these pollutants, as well as other pollutants (i.e., NO_x and CO), for which dispersion modeling is commonly required. Therefore, these engines should be considered in the modeling analyses or justification should be provided for the exclusion of these engines on a pollutant-by-pollutant and averaging period-by-averaging period basis.

The modeling analysis for the proposed plant appropriately addressed the emission units at the plant that would be part of the normal operation of the plant. This was appropriate because the air quality impacts of emergency engines, which operate intermittently, cannot reasonably be addressed by existing approaches to the air quality modelling for proposed sources. These approaches are based upon units emitting at constant or steady emission rates. However, the emergency engines at the plant will only operate infrequently, usually for periods of less than one hour per month. If modelling were conducted for the engines at their hourly emission rates, the impacts of the engines on air quality would be grossly overstated. For annual and 24-hour NAAQS, this would be because the emissions of the engines would be overstated since these engines will typically operate for at most a few hours in any year and for less than an hour in any day. For 1-hour NAAQS, this is because the modeling would assume that the engines operate continuously, i.e., every hour of the year, and therefore the engines would be operating during the meteorological conditions that result in maximum impacts, both by themselves and in conjunction with the impacts of other emission units at a proposed plant. In this regard, recent USEPA guidance specifically recognizes the difficulty in conducting appropriate air quality analyses for units like emergency engines units and specifically provides that such units need not be included in modeling for the 1-hour NO_2 and SO_2 NAAQS.[20]

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[19] The fact that the PM_{10} and $PM_{2.5}$ emissions of the kilns during low-load operation are limited to the same hourly rates as during normal operation should not be assumed to mean that the kilns will emit at these levels whenever the kilns are operating at low load. Rather, these limits are a consequence of the need to appropriately set BACT for periods of low-load operation of the kilns. During such periods, BACT limits in terms of pounds/hour are not appropriate because a kiln may be producing little or no lime. However, during such periods, as during normal operation, Condition 2.1.3-2(d) provides that the kilns and their control systems must also be operated in accordance with good air pollution control practice to minimize emissions. In practice, this requirement will be the critical constraint on the PM_{10} and $PM_{2.5}$ emissions of the kilns during low-load operation.

[20] Refer to USEPA Memorandum of March 1, 2011, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard," and again in its December, 2013 guidance, "SO_2 NAAQS Designations Modeling Technical Assistance Document." This guidance indicates that modeling to address the 1-hour NO_2 and SO_2 NAAQS should generally not include emission units that would operate for less than 500 hours per year.

> EPA believes that existing modeling guidelines provide sufficient discretion for reviewing authorities to exclude certain types of intermittent emissions from compliance demonstrations for the 1-hour NO_2 standard under these circumstances…

29. The exit velocity for Unit B06 at Anheuser-Busch in the 1-hour SO_2 regional inventory in the July 2012 modeling submittal on behalf of Mississippi Lime was very high (143.73 m/s). Exit velocities in excess of 50 m/s are commonly flagged as suspect and worthy of verification. There was no indication of any additional verification conducted on the validity of this exit velocity in the Mississippi Lime submittals or in the Project Summary.

The likely error in the regional inventory identified by this comment would not affect the results of the SO_2 modeling in a way that would require further modeling to be conducted for the proposed plant. First, Anheuser-Busch is located about 25 miles from the site of the proposed project. Second, a high exit velocity for Unit B06 at Anheuser-Busch may have underpredicted impacts in the vicinity of this source. This is because a higher exit velocity would increase plume rise and the effective stack height. However, this would act to increase contributions at greater distances. If the exit velocity of the Unit B06 to be reduced and remodeled, it would be expected to have less impact in the areas of highest modeled impact for the proposed project, which are near the project. Since the existing modeling has already shown that the NAAQS and PSD Increments are not violated, the project does not need to be remodeled using a lower exit velocity for Unit B06.

30. As required by 40 CFR 52.21(m), projects triggering PSD review must include an analysis of ambient air quality in the area where the source will be located. As discussed in a March 2013 Question and Answer document issued by USEPA and reiterated in USEPA's Guidance for $PM_{2.5}$ Permit Modeling released in April 2014, in light of the early 2013 court decision vacating the Significant Monitoring Concentration for $PM_{2.5}$, each PSD application must include ambient monitoring data representative of the area of concern. In the revised dispersion modeling analysis for PM_{10} and $PM_{2.5}$, there is no comparison against Significant Monitoring Concentrations and also no presentation of a justification that representative ambient monitoring data for PM_{10} or $PM_{2.5}$ are available. If a justification of waiving the requirement for the facility to conduct pre-construction monitoring is not provided for review and comment by the public, then Illinois EPA should require, prior to issuance of the PSD permit, the collection of preconstruction monitoring data to assess existing ambient air quality in the area.

The Illinois EPA did not rely on the Significant Monitoring Concentrations for various pollutants to waive requirements for pre-construction ambient monitoring. Rather, the Illinois EPA found that existing ambient air monitoring stations provided data that could

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We recognize that case-specific issues and factors may arise that affect the application of this guidance, and that not all facilities required to demonstrate compliance with the 1-hour NO_2 NAAQS will fit within the scenario described above with clearly defined continuous/normal operations vs. intermittent/infrequent emissions. Additional discretion may need to be exercised in such cases to ensure that public health is protected. For example, it would be appropriate to consider using this guidance for an intermittent source that is permitted to operate up to 500 hours per year, but typically operates much less than 500 hours per year and on a random schedule that cannot be controlled.

USEPA, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard," p. 9, 10.

appropriately be used to address the requirement of the PSD rules for an analysis of existing air quality. The location of the proposed plant does not pose concerns that necessitate pre-construction ambient monitoring. The area is rural and does not contain existing point sources whose impacts on air quality in the vicinity of the plant are most appropriately addressed with pre-construction monitoring. Representative data from existing ambient monitors at similar rural locations or more conservative data from existing monitors in more developed areas can appropriately be used to provide information on background air quality in the air quality analyses performed for the proposed plant. For PM_{10} and $PM_{2.5}$, representative data for the air quality in the location of the proposed plant is available from existing ambient monitoring stations operated by the Illinois EPA and the Missouri Department of Natural Resources. The background levels of air quality used for the initial analyses were from the Illinois EPA's monitoring station in Baldwin, Illinois, about 15 miles northwest of the plant site. The background levels for later modeling were from the station in Bonne Terre Missouri, about 25 miles west southwest of the plant site. Both stations are sited in small rural communities with some industrial sources so, if anything, would overstate the levels of existing particulate air quality at the site of the proposed plant.[21]

31. The elevations provided for certain dust collectors (Control Devices 61 through 65) in the December 2013 PM_{10} and $PM_{2.5}$ dispersion modeling report submitted on behalf of Mississippi Lime (124.97 meters) do not match the elevations used to calculate concentrations in the AERMOD model file (122.22 meters). This discrepancy should be resolved and the correct source height used in the final dispersion modeling. Considering how close the modeled concentrations are to exceeding the NAAQS and PSD Increments, this is a severe deficiency in the application, and AERMOD must be rerun to ensure that modeled violations are not being disregarded.

Control Devices 61 through 65 were correctly modeled using 122.22 meters as shown in the AERMOD modeling files. The elevations (i.e., the elevations of the ground surface or grade where these emission units would be located) from the table in the December 2013 submission, as referred to in this comment incorrectly listed the elevations at the same elevation as the rest of the proposed plant. Since the model includes the correct elevations, remodeling is not required. This is a minor error in the description of these units in the application. It does not constitute "a severe deficiency in the application." Furthermore, the comment has not provided any information explaining why this error would make the application deficient.

32. For Roadways and Parking Areas and Limestone Storage Piles (EP03, EP66, and EP67), the equivalent annual emission rates of PM_{10} and $PM_{2.5}$ modeled, as specified in the appendices to the December 2013 PM_{10} and $PM_{2.5}$ dispersion modeling report, are less than the emission limits

[21] The current design values for $PM_{2.5}$ at the monitor in Bonne Terre, Missouri, are 21.03 $\mu g/m^3$ 24-hour average and 9.40 $\mu g/m^3$, annual average. This monitor is a speciation monitor collecting data for the principle component in the $PM_{2.5}$ (e.g., nitrates, sulfates and carbon). This information is useful in understanding the role of different types of sources in contributing to $PM_{2.5}$ air quality in an area. Speciation monitors are commonly considered to provide conservative data, measuring higher concentrations than ambient monitors that simply measure $PM_{2.5}$.

specified in Draft Condition 2.4.6. The modeling analysis should be revised such that permit-limited emission rates are modeled.

For roadways and parking areas, the further review of emission data triggered by this comment confirmed that the emission data in the December 2013 Modeling Report was correct. The emissions that would have been allowed by Draft Condition 2.4.6 were incorrect, with slightly lower PM_{10} emissions having been modeled. (The modelled emissions of $PM_{2.5}$ were actually slightly higher than would have been allowed by Draft Condition 2.4.6.) In the issued permit, these inconsistencies have been corrected so that the permitted emissions reflect the modeled emissions. A related change was also made for the permitted emissions of PM.

For the limestone storage piles, the further review triggered by this comment also confirmed that the emission data in the December 2013 Modeling Report was correct and there was an error in the emission data that was the basis of the limits in Draft Condition 2.4.6. That data assumed that wind erosion was continuous, even though wind erosion only occurs when wind speeds are above a threshold level. In the issued permit, the permitted emissions of PM_{10} and $PM_{2.5}$ from the limestone piles have been reduced to be consistent with the modeled emissions. A related change was also made for the permitted emissions of PM.[22]

33. The Source ID descriptions for volume sources included in PM_{10} and $PM_{2.5}$ dispersion modeling, as specified in the appendices to the December 2013 PM_{10} and $PM_{2.5}$ modeling report, do not correspond with the emission unit descriptions in Draft Condition 2.2.2. For example, EP93 through EP102 are listed in the draft permit as "Conveyors", but EP93 is listed in the December 2013 modeling report as a "Feeder" and EP95 and EP96 are listed as "Weigh Feeders". Additionally, EP6, which is identified as a "Screen" in Draft Condition 2.2.2 is not identified as an emission unit in the December 2013 modeling report. These discrepancies should be corrected so that confirmation can be made that the emission limits in Draft Condition 2.2.6 are the emission rates included in the modeling analysis. Any revised modeling should be made available for review and public comment prior to issuance of the PSD permit.

Additional equipment has not been added to the project. However, early in the application process, all emission units with the same emission factor and controls were grouped together. For example, because feeders, weigh feeders and conveyors all use the "Conveyor Transfer Point (controlled) "SCC 3-05-020-06" emission factor from Table 11.19.2-2 of AP-42, those units were grouped together as "conveyors."

34. The Project Summary does not indicate that the NAAQS regional inventory or the PSD Increment consuming inventory was updated to reflect current data. The dispersion modeling information utilized for the 2010 permit appears to have been used for the permit being proposed in 2014. As there have been significant changes to these inventories since the development of the original inventories, the modeling should be updated to ensure that the NAAQS and PSD Increments are protected. Further, if

[22] It is also noteworthy that wind erosion does not meaningfully contribute to the maximum air quality impacts of the proposed facility. Wind erosion only occurs during periods when wind speeds are above a threshold level, when dispersion would also be good. However, maximum impacts occur near the property line and are associated with low wind speeds and poor dispersion.

any changes were made to the inventories since the original submittal, these changes need to be documented for appropriate opportunity for public review and comment.

Based on available information, no projects have been permitted since 2010 that would necessitate updating the NAAQS regional inventory or the PSD Increment consuming inventory. Therefore, continued use of the 2010 inventories was appropriate. In addition, the ambient monitoring conducted for the region indicates that the air quality in the region continues to improve.

35. Draft Condition 2.1.2-3(b)(ii) would provide that the BACT emission limits in Condition 2.1.3-2(b)(i) would not apply during periods when the kiln(s) are on hot standby or operating at less than 30 percent of capacity, providing instead that the short-term emission limits in Draft Condition 2.1.6(a) would apply and constitute BACT. For SO_2, NO_x, and CO, the CEMs required by Draft Condition 2.1.8-1 will provide an adequate demonstration of compliance with the proposed BACT emission limits. The draft permit is deficient in describing an adequate method for demonstrating compliance with short-term PM, PM_{10} and $PM_{2.5}$ limits (lbs/hour) during these specific events. The permit should include a condition that addresses the PM limits for these time periods as has been done in other permits issued by the Illinois EPA. For example, the Construction Permit for Universal Cement, ID. No: 031600GVX, Condition 2.1.8-1(c), requires that the facility install and maintain a PM CEMS to demonstrate compliance during both normal operations and during periods of startup, shutdown and malfunction.

During periods when the pounds/ton emission rates for particulate (PM, PM_{10} and $PM_{2.5}$) will not apply to the kilns, compliance with the alternative limits in pounds/ton will be determined by engineering analysis. These analyses will necessarily rely on measured data for particulate emissions in pounds/ton. This is both necessary and appropriate because emission during these periods will not be able to be directly measured by testing. This is because startup and shutdown of the kilns will be transitory periods. Similarly, operation at reduced load will temporary.

The circumstances of Universal Cement provide limited insight on this matter. First, for PM_{10} and $PM_{2.5}$, they are similar to those of Mississippi Lime. This is because continuous emission monitoring will only be conducted for PM and not for PM_{10} and $PM_{2.5}$. With respect to PM, the permitted PM emissions of the kiln at Universal Cement are more than those of the kilns at Mississippi Lime.[23] In addition, continuous monitoring for PM is required for new Portland cement kilns by the applicable National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63.1349. This confirms that such monitoring is feasible and appropriate. Continuous PM monitoring is not required by the applicable NSPS or NESHAP for lime kilns.

36. Draft Condition 2.1.3-2 would set BACT for NO_x for the proposed kilns at 3.5 lbs/ton of lime, 30-day average. Further, Draft Condition 2.1.3-

[23] The PM emissions of the cement kiln at Universal Cement were limited to 89.4 tons/year by Permit 08120011, whereas the PM emissions of each lime kiln are limited to only 31.0 tons/year.

2(a)(ii) indicates that the control technology determination for NO_x was low excess air.

In the Project Summary, pages 36 through 41, the Illinois EPA indicates that there is insufficient data upon which to establish a lower limit. For example, page 39, footnote 98, quoted below, suggests that measured emissions from existing kilns systems [with BACT technology] are only slightly below 3.5 lbs/ton lime:

> …The next highest emission rates for actual NO_x emissions of lime kilns indicate that an emission limit of 3.5 pounds per ton of lime is appropriate as NO_x BACT. The second and third highest NO_x emission rates measured at existing kilns are both 3.45 pounds per ton of lime (Chemical Lime, O'Neal, Kiln 2, June 15, 2007, and MLC, Verona, September 2008). These emission rates are only slightly below 3.5 pounds per ton. Moreover, the applicable NO_x emission rate for Chemical Lime, O'Neal, Kiln 2, is 3.69 pounds/ton, so that the NO_x emissions measured during the June 2007 test were only 93.5 percent of the applicable rate.

The statements in the BACT discussion in the Project Summary are inaccurate and incomplete. There are three preheater rotary lime kilns, very similar to those proposed by Mississippi Lime, in the United States using Selective Non-Catalytic Reduction (SNCR) technology to control NO_x emissions. In addition, SNCR technology is proposed to be installed on two existing kilns to comply with limits for NO_x that reflect a reduction of 50% from baseline levels. A summary of these applications of SNCR technology on rotary lime kilns is provided below.

Lhoist North America (Lhoist), O'Neal, Alabama (O'Neal plant)

The O'Neal plant has successfully used SNCR on both of its preheater rotary kilns to significantly reduce NO_x emissions. Kiln 1 was constructed in 1997 and Kiln 2 was constructed in 2007.

Actual emissions of NO_x, based on CEMS data, from O'Neal Kilns 1 and 2 for 2012 and 2013 are summarized below. (Detailed data was included with the comments.)

Year	Emission Rates (lbs NO_x/ton lime)			
	Kiln 1		Kiln 2	
	Maximum Monthly	Annual Average	Maximum Monthly	Annual Average
2012	2.9	1.8	2.4	1.2
2013	2.8	1.1	1.3	1.1

The NO_x emission of O'Neal Kilns 1 and 2, combined, are limited to a total of 791.5 tons/year and 83 tons, on a 30-day rolling average. As each kiln has a permitted capacity of 1500 tons of lime per day, the effective annual emission limit, for the kilns if operating at permitted capacity, would be 1.45 lbs NO_x/ton of lime. The effective 30-day rolling average emission limit, when operating at rated capacity, would be 1.84 lbs NO_x/ton of lime. Kiln 1 also retains its original BACT limit of 3.5 lbs NO_x/ton of lime, 3-hour average. These emission limits were established by the permit amendments issued by the Alabama Department of Environmental Management (ADEM)

in 2005. (Permits 411-0039-X028 and –X029 for Lhoist O'Neal were attached to these comments.)

Unimin Corporation, Calera, Alabama (Unimin).

Unimin installed an SNCR system in October 2010 on its preheater rotary lime kiln in Calera, Alabama, to achieve compliance with a NO_x limit of 3.2 lbs NO_x/ton of lime. The plant reported in a meeting on November 3, 2011 of the Environmental Committee of the National Lime Association that compliance was being achieved for an operating cost of less than 0.5 percent per ton of lime produced.

In addition, a rulemaking by USEPA requires retro-fitting of SNCR technology to two existing preheater lime kilns at Lhoist's lime facility in Nelson, Arizona. This rulemaking requires implementation of Best Available Retrofit Technology (BART) on these kilns for the NO_x emissions to reduce their contribution to visibility impairment in mandatory Class I Areas under the PSD Program, pursuant to Section 169A of the Clean Air Act. Kilns 1 and 2 at the Lhoist's Nelson lime facility were constructed in 1973 and 1976 respectively. Both kilns are subject to requirements to use BART controls for NO_x. On June 27, 2014, the USEPA Administrator signed the Arizona; Regional Haze and Interstate Visibility Transport Federal Implementation Plan (FIP).[24, 25] This proposed rule would limit NO_x emissions of Nelson Kiln 1 to 3.80 lbs/ton of lime and Nelson Kiln 2 to 2.61 lbs/ton of lime on a 30-day rolling basis, with compliance demonstrated by CEMS. The preamble for this rulemaking indicates that these limits are equivalent to using SNCR control technology. Further, the proposed rule would limit the combined NO_x emissions from Kilns 1 and 2 to 3.27 tons/day. These limits are based on SNCR providing a 50 percent reduction from historical actual emission levels. As USEPA has clearly documented that SNCR is technologically and economically feasible, even in retrofit situations, Mississippi Lime's BACT analysis must be updated to account for the use of SNCR technology on the proposed lime kilns.

Moreover, Kiln 3 at Lhoist's lime plant in New Braunfels, Texas is a kiln that is not equipped with SNCR that is subject to a BACT Limit lower than 3.5 lbs/ton. New Braunfels Kiln 3 is a preheater rotary kiln constructed in 1983. The BACT limit for this kiln is 2.6 lbs NO_x/ton of lime based on proper kiln design and operation (Permit 7808 and PSDTX256M3). Compliance with this limit is demonstrated with a CEMS. The maximum 30-day average emission rate from this kiln in 2013 was 2.39 lbs NO_x/ton lime (NO_x emission data for 2013 data was attached to these comments.)

In summary, existing data clearly demonstrate that an emission limit of 3.5 lbs NO_x/ton of lime, 30-day rolling average, is not BACT for a new rotary lime kiln. SNCR is readily available, demonstrated, and economically feasible for preheater rotary lime kilns.

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[24] Arizona Federal Implementation Plan (FIP) EPA-R09-OAR-2013-0588.

[25] This plan resulted in numerous comments that claim that USEPA has previously determined that SNCR is an available technology for lime kilns and Portland cement kilns. These comments were addressed by USEPA in its notice of proposed rulemaking in the Federal Register (79 FR 9320, February 18, 2014), which was published at beginning the public comment period for this rulemaking.

Based on the new information provided by Lhoist in this comment and in other related comments, the Illinois EPA has further evaluated BACT for the kilns for NO_x emissions. The Illinois EPA has determined that SNCR technology is available and must be used on the proposed kilns to further reduce emissions of NO_x. The issued permit sets an additional BACT limit for the NO_x emissions of the kilns that applies on an annual basis, i.e., 2.6 pounds/ton. In addition, a control technology demonstration for NO_x is required pursuant to which a lower limit may be established. This demonstration would consider the initial operation of the kilns after the startup and shakedown of the kilns is complete.

These requirements reflect USEPA's initial BART rulemaking for Kiln 2 at Lhoist's Nelson lime plant.[26] As that rulemaking addressed Kiln 2, it appropriately addressed the utilization of SNCR technology at the proposed kilns. As reflected in USEPA's rulemaking, there is minimal data available on the use of SNCR on lime kilns. While Lhoist's comments provide data for NO_x emissions from the kilns at its O'Neal facility, this data is only sufficient to generally confirm the availability and feasibility of SNCR technology. It should not be used as a basis to set a BACT limit for the proposed kilns. This is because Lhoist has not provided detailed information on how SNCR technology has been adapted for use on the kilns at its O'Neal plant. Moreover, even if such information had been provided, Lhoist has not shown that such approach(s) are generally applicable to any new lime kiln or, considering proprietary aspects of the approaches, would be available to Mississippi Lime.[27] *See also In Re Cardinal FG Co.,* 12 E.A.D. 153, 170 (2005) (concluding that permits need not reflect the lowest emissions limit demonstrated at a similar facility because the selected limit must consider whether the source can achieve compliance on a consistent basis).

37a. Table 3-1, Page 42, of the Project Summary contains incomplete and erroneous information on the enforceable emission limits for Kiln 1 and Kiln 2 at Lhoist's O'Neal Plant.

The emission limit listed for Kiln 1, is 3.5 lbs NO_x/ton of lime. It is important to note that this is a short-term limit based on a 3-hour average. This limit was established as part of the original, 1996 BACT limit for this kiln and remains in effect.

The O'Neal Plant was modified in 2005 to add a second preheater rotary lime kiln. The new permits (Permits 411-0039-X028 and -X029, attached to my comments) retained the existing BACT limit for NO_x on Kiln 1 and

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[26] Pursuant to a petition from Lhoist, USEPA subsequently reconsidered its initial BART determination for the Nelson facility and revised certain aspects of its rules for this facility. However, these revisions are not relevant to the BACT determination for the NO_x emissions of the proposed kilns. Most significantly, this determination is not a determination of retrofit control technology for an existing emission unit. Rather the BACT determination for the proposed plant must address the emissions limit that is achievable at new lime kilns that were designed for use of this technology.

[27] In its ongoing interaction with USEPA concerning the BART rulemaking for its facility in Nelson, Arizona, Lhoist continues to note that the SNCR systems for those kilns may incorporate proprietary technology and equipment and will need to be treated as confidential business information by USEPA. Letter, Earl Hiser, Counsel for Lhoist, Jorden Bischoff & Hiser, PLC, to Regina McCarthy, Administrator, USEPA, October 31, 2014, Attachment 1, Item 3(d).

established additional, plant-wide limits of 791.5 tons per 12-month period and 83.0 tons in any consecutive 30-day period (as determined by continuous emission monitoring). As each kiln is rated at 1500 tons of lime per day, the effective enforceable NO_x limits for Kilns 1 and 2, combined, if both kilns operated at rated capacity, would be 1.84 lbs/ton of lime, 30-day average, and 1.45 lbs/ton of lime, 12-month rolling average.

These NO_x limits are achieved by means of combustion and process control and the use of Selective Non-Catalytic Reduction (SNCR) technology. As noted in other comments submitted by Lhoist, SNCR is a demonstrated control technology for preheater rotary kilns of the type being proposed by Mississippi Lime. The emission limit shown in Table 3-1 for O'Neal Kiln 2 is incorrect. It appears that the 3.69 lbs/ton value was derived by using the plant-wide limit of 83.0 tons (for Kilns 1 and 2 combined), and then assumed Kiln 1 did not operate at all, to arrive at the effective limit of 3.69 lbs/ton. As Kiln 1 was, and continues to be, in operation, the 3.69 lbs/ton is incorrect. It is also important to note the averaging period for each of the applicable limits and that compliance is demonstrated by means of continuous emission monitoring for both kilns.

While the information on the chronology of events at the O'Neal plant provided in this comment corrects information in the record for this project, as expressed in the Project Summary, this comment does not provide additional insight on an appropriate BACT limit for NO_x for the proposed kilns. It merely confirm that a limit lower than 3.5 pounds/ton will be achievable with SNCR technology.

It should also be noted that this comment does not show that either kiln at Lhoist's O'Neal plant is subject to a NO_x limit lower than 3.5 pounds/ton. Indeed, Kiln 2 is not subject to any limit for NO_x emissions in pounds/ton of lime. It is also not individually subject to any limits for NO_x.

37b. The NO_x emission data for the O'Neal Plant shown in Table 3-2 of the Project Summary is incorrect, incomplete and provides misleading information with respect to actual NO_x emissions from these kilns. First, with respect to the data shown for Kiln 1, the SNCR system was not fully installed and certified at the time of the November 2005 and 2006 stack tests. The NO_x emissions shown for these two tests were achieved using combustion control without application of SNCR.

The emission data for the March 2007 stack test on Kiln 1 reflects compliance with the BACT limit of 3.5 lbs/ton, on a 3-hour average basis. This short-term test was not intended to demonstrate compliance with the applicable 30-day rolling average limit nor with the 12-month average limit.

The NO_x emission data shown for Kiln 2, dated June 15, 2007, were from after only three months of operation as Kiln 2 started operation March 20, 2007. This data was collected prior to the SNCR system being optimized as is evident from the publically available CEMS data provided in Comment 12, which shows annual average emission rates of 1.2 and 1.1 lbs NO_x/ton lime for 2012 and 2013, respectively.

As noted in Lhoist's comments on Table 3-1, the "Permit Limit" values shown in Table 3-2 for both Kilns 1 and 2 are incomplete and incorrect. While there is an enforceable 3-hour average NO_x limit of 3.5 lbs NO_x/ton of lime for Kiln 1, additional, lower, enforceable emission limits apply to Kiln 1 and Kiln 2 for both the 30-day and 12-month periods. Emission limits for all three averaging periods should be considered when establishing BACT for the proposed kilns. The O'Neal kilns have complied with these emission limits since 2007 using SNCR technology.

While the information in this comment also clarifies data for the Lhoist's O'Neal plant, it does not provide additional insight on an appropriate BACT limit for NO_x for the proposed kilns. It merely confirm that a limit lower than 3.5 pounds/ton will be achievable with SNCR technology.

37c. Table 3-4 of the Project Summary, appearing on Page 48, does not provide full, accurate and current emission data representative of the O'Neal kilns. Table 3-4 also contains incomplete and inaccurate information related to the enforceable emission limits applicable to the O'Neal kilns, as explained in more detail in my comments on Tables 3-1 and 3-2 of the Project Summary.

The comment merely restates earlier comments, confirming that there is more recent NO_x emission data for the Lhoist's O'Neal plant. The mandatory NO_x evaluation period will assure that the BACT limit is appropriate.

38. With regard to the Project Summary, page 46, Table 3-3, the Illinois EPA has presumed it is appropriate to invalidate all NO_x data that was collected when a kiln exceeded the applicable CO emission limit. This premise is not valid as CO can exceed a limit for multiple reasons unrelated to NO_x emissions. For example, raw materials containing high concentrations of organics can lead to a relatively high CO emission rate.

Table 3-3 lists six performance tests for Graymont Superior Kiln 5 (constructed in 2007) that demonstrate average NO_x emission rates ranging from 1.80 lbs/ton of lime to 2.08 lbs/ton of lime. Table 3-3 suggests that these data are not compliant for CO and, thus, were not considered in the BACT analysis. However, one of the tests indicates the CO emission rate was "Compliant" and the rest are anticipated to be higher than the CO limit due to either high concentrations of organics in the raw materials or a low CO emission limit. The effective CO limit for this kiln is 3.12 lbs/ton lime (84.2 lbs/hour @ 54 tons stone feed per hour, 2 tons stone feed/ton lime) on a 3-hour basis. When accounting for the 3-hour averaging period applicable to this kiln, it could be argued that the kiln's CO limit is more restrictive than the limit proposed by Mississippi Lime, 2.5 lbs/ton lime on a 24-hour average.

As Kiln 5 at Graymont Superior is able to achieve NO_x emission levels of 1.80 to 2.08 lbs/ton lime without SNCR, while having an emission limit for CO that is arguably more restrictive than that of the proposed kilns, the BACT limit for the proposed kilns should not be set at 3.5 lbs/ton lime. The Illinois EPA must re-evaluate the data in Table 3-3 and update the BACT limit for the proposed kilns accordingly.

This comment is no longer relevant since a more stringent BACT limit has now been set for NO_x based on information supplied in other comments. More generally, the emission test data addressed by this comments for Graymont Superior Kiln 5 indicates that the NO_x and CO emissions of lime kilns are related. Less efficient combustion, as indicated by higher levels of CO emissions, acts to lower NO_x emissions. In the case of Superior Kiln 5, based on the data from six tests, the source could consistently comply with the nominal limit for NO_x, 3.66 lbs/ton, but could not do so without elevated levels of CO that did not consistently comply with the applicable limit for CO.[28]

39. The proposed BACT limit for NO_x in the 2010 permit was 3.5 lbs/ton of lime on a 24-hour basis. The draft permit retained the 3.5 lbs/ton of lime emission limit but extended the compliance time-period to a 30-day rolling average. The longer averaging period proposed in the draft permit should have resulted in a reduction in the numeric value of the emission limit, otherwise, the change is simply a reduction in stringency that is not consistent with currently demonstrated emission rates from preheater rotary lime kilns, as address in my previous comments.

This comment is no longer relevant since a more stringent BACT limit has now been set for NO_x based on information supplied in other comments. As noted in other comments, for lime kilns equipped with SNCR, performance for NO_x emissions is routinely addressed using emission data that is expressed as a 30-day rolling average.

40. The Project Summary, Footnote 88, page 36, states:

> The Illinois EPA also contacted a number of states in an attempt to obtain relevant information about the emissions of lime plants, including Alabama, Indiana, Kentucky, Michigan, Nevada and Wisconsin. These efforts were generally unsuccessful. The emission test data that was received was not accompanied by complete information about the operating conditions during testing, including limestone feed or lime production rate, fuel usage rates and the fuel mix.

Neither the Illinois EPA nor Mississippi Lime contacted Lhoist to request emission information. Consequently, the analysis did not include all available data and the analysis must be re-evaluated to factor in the data that was neglected. Illinois EPA's assertion that other state agencies provided incomplete information in response to a request for information is not adequate justification for ignoring readily available information documenting the economic and technical availability of SNCR as a viable control technology for NO_x emissions from the proposed source.

As discussed in response to other comments, the emission data and other information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed facility. This information has resulted in

[28] It should also be noted that caution should be exercised when using nominal or "equivalent" limits in lbs/ton calculated from emission limits in lbs/hour and design production rates in tons/hour. This is because a source can elect to operate a kiln at a reduced production rate to comply with a emissions limit in pounds/hour.

significant changes to the permit as compared to the draft permit. This is appropriate. One function of a comment period on a draft permit is for a permitting authority to be provided with additional information that it had not considered that may be relevant to a proposed action. In this regard, the fact that Lhoist had not previously been directly contacted to obtain emission data does not mean that the development of the draft permit was flawed.[29] That emission data, as has been provided by Lhoist with its comments, has now been considered.

41a. The Project Summary, Footnote 88, page 36, also states:

> Information was received that confirmed that setting limits for the emissions and operation of a kiln that are appropriate, i.e., are not overly restrictive, can be difficult. Graymont, Superior pursued a revision to its permit following emission testing that did not show compliance (New Source Review Permit Application, May 2008.) Graymont also requested revision of the permit for a facility in Nevada to eliminate a requirement on the sulfur content of fuel as the low sulfur fuel was no longer available in the region. It opted to conduct continuous emission monitoring for SO_2 in place of limits on the sulfur content of the fuel for the kilns.

This is not relevant to the NO_x emission control information which has been made available to Mississippi Lime through the National Lime Association. This statement is also not relevant to the NO_x emission control information, which is available to Illinois EPA and Mississippi Lime through the public record of the BART determinations for lime plants in Arizona. Mississippi Lime and the Illinois EPA also failed to review information on the cost and effectiveness of NO_x controls that is available through the USEPA and as cited in the Federal Register notice for the Federal Implementation Plan for Arizona for BART (79 FR 9320, February 18, 2014).

As already discussed, the emission data and other information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before the issuance of the permit for the proposed facility. This comment does not show that the cited statement in the Project Summary was inaccurate. Indeed, the further analysis conducted prior to the issuance of a permit for the proposed facility revealed that Lhoist obtained a revision to the permit for its O'Neal lime facility in Alabama to adjust the emission limits that were set for the kilns.

41b. Mississippi Lime and the Illinois EPA also failed to review information on costs and effectiveness of SO_2 controls that is available through the USEPA and as cited in the Federal Register notice published for the Arizona BART FIP (79 FR 9320, February 18, 2014).

As already discussed, the data and information that Lhoist provided in its comments has been considered as part of the further analysis that

[29] In its application for the proposed plant, Mississippi Lime included information about the NO_x emissions of Lhoist Nelson that was publicly available from the Alabama Department of Environmental Management. It is unrealistic to expect that more data would have been forthcoming if Lhoist had been contacted directly. In this regard, it appears that such data was only forthcoming when after a draft permit had been prepared that did not consider Lhoist's successful use of SNCR on its lime kilns.

was conducted before of the issuance of the permit for the proposed facility.

As specifically related to the information concerning SO_2 emissions cited by this comment, this information does not support any changes to the BACT determination for the proposed kilns. The circumstances of the proposed plant will be substantially different from those of Lhoist Nelson. Accordingly, the information on costs and effectiveness of SO_2 controls prepared by USEPA for Lhoist Nelson when developing the BART FIP is not transferable to the proposed plant. For the proposed plant, very effective control of SO_2 kilns is required with natural scrubbing, with emissions limited to 0.5 pounds of SO_2 per ton, 30-day average. The Arizona BART FIP would limit the SO_2 emissions of Kilns 1 and 2 at Lhoist Nelson to 9.32 and 9.73 pounds/ton of lime, annual average. These limits are an order of magnitude higher than the limit set for the proposed kilns. As such, additional control measures such as fuel switching or dry sorbent injection are significantly more cost-effective at Lhoist Nelson than at the proposed plant.[30]

42. The Project Summary, page 37, states:

> The proposed BACT limit for NO_x was developed from the information that has been assembled for the permitted and actual NO_x emissions of existing rotary lime kilns equipped with preheaters, like the proposed kilns.

The Illinois EPA has indicated that the proposed BACT limit was based on actual emissions of NO_x from existing rotary kilns. However, as detailed in the following comments, the emission data contained in the Project Summary contains significant errors and omissions. As a result, the proposed BACT limit for the proposed kilns is in error and must be re-evaluated based on complete and accurate data.

As already discussed, the information that Lhoist provided in its comments has been considered as part of the further analysis that the Illinois EPA has conducted before issuance of the permit for the proposed facility. The information that was considered included the further background and explanation on the emission data that had been obtained for Lhoist's O'Neal lime facility.

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[30] Given the level of control of SO_2 required at the proposed plant with natural scrubbing, it is questionable whether dry sorbent injection would provide any further reduction in SO_2 emissions. It would certainly not provide a further 40 percent reduction in SO_2 emissions as used by USEPA in its cost-effectiveness analysis for Lhoist, Nelson. In this regard, for that analysis, USEPA's cost-effectiveness analysis for dry sorbent injection was based on reductions in SO_2 emissions of 628 and 960 tons/year for Kilns 1 and 2, respectively. Assuming for purposes of discussion, that dry sorbent injection would also provide a 40 percent reduction in the SO_2 emissions of the proposed plant, its use would only reduce the SO_2 emissions of the proposed plant by 87.6 tons/year (216 tons/year x 0.4 = 87.6 tons/year.) As such, the cost of dry sorbent injection for the proposed plant would be at least 10 times that of Lhoist Nelson. (The capital cost would be similar but operating costs would be much less, resulting in about half the annual cost. The reduction in SO_2 emissions would be about one twentieth those achievable at Nelson. Overall, the technology would be ten times less cost-effective even assuming that a 40 percent reduction would be achieved.) Similarly, the reduction in SO_2 emissions that would accompany from use of lower sulfur coal is "diluted" by the effectiveness of the natural scrubbing that is required.

43. The Project Summary, page 37, also states:

> Information has been assembled for the BACT limits for NO_x emissions and actual NO_x emissions of other new lime kilns. These other new kilns are generally similar to the proposed kiln, having the same control technology for NO_x as would be used by the proposed kilns.

As explained in an earlier comment, this statement ignores the SNCR systems that have been installed on the kilns at Lhoist O'Neal, Alabama and Unimin, Alabama and the fact that USEPA has determined SNCR to be technically and economically feasible for the kilns at Lhoist Nelson. Likewise this statement ignores the BACT determination for the kilns at Lhoist New Braunfels, Texas.

As already discussed, the information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed facility. This includes the fact that SNCR technology is being used on certain lime kilns. Incidentally, it is noteworthy that the information that was previously available for Lhoist's O'Neal facility did not indicate that SNCR technology was being used on the kilns.

44. The Project Summary, page 37, also states:

> The data that has been assembled on NO_x emissions of lime kilns is summarized in the tables at the end of this discussion. The NO_x emission limits that have been set for other new lime kilns are listed in Table 3-1. The BACT limits for NO_x are readily available from USEPA's RACT/BACT/LAER Clearinghouse. For these other new kilns, the lowest limit set as BACT for NO_x is 3.5 pounds per ton of lime produced, with compliance generally subject to verification by emission testing. This limit applies to four of the 20 new kilns for which BACT or other NO_x limits are known. The other new kilns are subject to less stringent NO_x limits, up to 4.8 pounds per ton of lime.

This statement also ignores the SNCR systems that have been installed on the kilns at Lhoist O'Neal and Unimin Calera and that SNCR has been determined by USEPA to be technically and economically feasible for the kilns at Lhoist Nelson. Likewise this statement ignores the BACT determination for the kilns at Lhoist New Braunfels.

As already discussed, the information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed facility.

45a. The Project Summary, page 37, also states:

> This information does not suggest that a limit lower than 3.5 pounds per ton of lime, the lowest limit that has previously been set, should now be considered achievable. The evaluations of technical feasibility and control effectiveness of control options for NO_x, in Steps 2 and 3 of the Top-Down BACT Process did not identify developments or improvements in the NO_x control technology of lime kilns that would now be used for the proposed kilns, as compared to that of other new lime kilns. Thus improvements in NO_x control

technology do not provide a basis to find that a lower limit would now be achievable for the proposed kilns. Accordingly, the other basis upon which to establish a lower NO_x limit for the proposed kilns would be data for the actual NO_x emissions of kilns if it shows that existing NO_x control technology is more effective and reliable such that a lower NO_x BACT limit may now be established.

As is apparent from earlier comments, this statement ignores the SNCR systems that have been installed on the lime kilns at Lhoist O'Neal, and Unimin Calera and that have been determined to be technically and economically feasible for the Lhoist Nelson kilns (EPA-R09-OAR-2013-0588). Likewise this statement ignores the BACT determination for the kilns at Lhoist New Braunfels, Texas.

As already discussed, the information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed facility.

45b. The BACT evaluation for the proposed kilns failed to examine the transfer of technology from similar sources such as the portland cement kilns. There are numerous portland cement kilns operating with SNCR in the Unites States. There are over 30 portland cement kilns in the United States that either have SNCR in place or are in the process of installing it. Further, all recent PSD permits for the portland cement industry have identified SNCR as BACT. Some of the PSD permits from the time period of the BACT analysis for the proposed facility that could have been considered are listed below, with the date that the permit was issued:

. Universal Cement, LLC – Chicago, Illinois, December 20, 2011
. CEMEX Southwest, LLC – Clinchfield, Georgia, January 27, 2010
. Buzzi Unicem – Maryneal, Texas, April 10, 2009

The issued permit would require use of SNCR technology on the proposed lime kilns because Lhoist's comments indicate that this technology is now being used on certain lime kilns. It is not being required because SNCR technology is commonly used on new kilns at portland cement manufacturing plants. Moreover, Lhoist's comments do not provide any information to suggest that SNCR technology as applied to kilns that make portland cement is directly transferable to lime kilns.

Incidentally, the BACT determination for the proposed kilns reflected in the draft permit considered technology transfer, with transfer of SNCR technology from Portland cement kilns to lime kilns. Transfer of SNCR technology was rejected because of the differences in these two types of kilns that affect the feasibility of use of SNCR technology and result in SNCR not being a directly transferable technology. The key difference is that the feed to cement kilns is a fine, milled material whereas the feed to a lime kilns consists of pieces of limestone rock.[31]

[31] Because of the form of the feed material to a cement kiln, the preheater/precalciner systems for cement kilns operate on a free-flowing exhaust gas stream from the kiln using a series of cyclones to keep the feed material moving counter-current to the gas stream toward the kiln. Because the gas flow is unimpeded and steady-state conditions exist in these systems, SNCR technology has been readily adapted to be used on modern cement kilns. SNCR can be installed and used in the area in the preheat/precalciner system where the temperature is suitable for SNCR to be effective

As a result, the designs of the preheater/precalciner systems for cement kilns are fundamentally different than the designs of preheater systems for lime kilns such that SNCR technology is now an established control technology for Portland cement kilns.[32] However, because of the difference between cement kilns and limes kilns, SNCR technology is not directly transferable.

46. The Project Summary, page 38, states:

> The collected data for the tested NO_x emission rates of lime kilns spans a wide range, ranging from less than 50 percent of the applicable limit to as much as 95 percent of the applicable limit. As a general matter, information is not available that would indicate that the range of measured NO_x emissions of kilns is anything other than the normal variation in NO_x emissions that is present for lime kilns that are properly operated and maintained.

The discussion of emission variability is simply justification for requiring continuous emission monitoring for NO_x, SO_2 and CO emissions from the kilns. It is not justification for relaxing emission limits and ignoring available, demonstrated emission control technology.

As already discussed, the information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed facility. In particular, SNCR is required for control of NO_x.

However, it should be recognized that compliance methodology and averaging time and are relevant aspect of emission limits. The combination of emission monitoring and longer compliance time periods enable emission limits to be set that better reflect the levels of emissions that are achievable with a control technology. They reduce the variability in operation and emissions that is observed when compliance is determined by emission testing. They also more directly reflect the typical performance of the control technology.

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in control of NO_x emissions. Reagent may be injected into the gas stream at this location and dispersed through the exhaust stream. As such, SNCR is now commonly considered a readily available technology for new, modern cement kilns equipped with preheat and precalciner systems and SNCR is commonly installed on such kilns. This is shown by information in the Clearinghouse.

Use of SNCR is much more challenging for lime kilns because of the feed to the kilns is a coarse material. The minimum size of the material is ½ inch and can be as big as 2 inches. The preheater systems on lime kilns, which are filled with solid feed material, impede the flow of the exhaust gas, which must travel through the spaces between the rock. The challenges to use of SNCR have, based on the comments provided by Lhoist only relatively recently been overcome. Accordingly, use of SNCR on lime kilns is a new development. As applied to lime kilns operated by companies other than Lhoist, one might even question whether this technology is available. This is because Lhoist has not shared information on the techniques that are used to apply SNCR on its lime kilns. Certainly, the Clearinghouse does not indicate that SNCR technology is being used in lime kilns.

32. As recently as June 2014, USEPA states in its BART Rulemaking for Arizona when discussing Lhoist's Nelson facility:

> …To our knowledge, SNCR has never been installed on a lime kiln. Given that this control technology will be retrofitted to a new source category for the first time, it is not unreasonable to expect unforeseen challenges and delays. EPA's timeline is conservative and takes into account this possibility.

47. The Project Summary, Footnote 94, page 38, states:

> It should be noted that a substantial, credible body of emission test data would be needed to adjust the BACT limit based on that data. This is because of the number of factors that may affect the NO_x emission rate of a lime kiln, which go beyond the fuel combustion system to the overall operation of the kiln system.

CEMS data for Lhoist's two rotary lime kilns operating with SNCR is available for the years 2008 through 2013. The emission data for these kilns clearly demonstrate the effectiveness of SNCR in controlling NO_x emissions from preheater rotary lime kilns of the type proposed by Mississippi Lime. This emission data, which is available to the State of Alabama, has not been requested by either the Illinois EPA or Mississippi Lime.

As Lhoist has provided relevant NO_x emission data for its kilns that are equipped with SNCR with its comments, this particular comment is only of incidental interest as related to the background for the proposed BACT determination for NO_x that was reflected in the draft permit. That determination was based on emission data that was available to the Illinois EPA when the proposed determination was made.[33] Moreover, the comment may be misleading as it suggests that more NO_x emission data was readily available to the Illinois EPA. While Lhoist provides certain NO_x emissions data to ADEM for its O'Neal facility for actual emissions in tons, that data does not appear to include production data or NO_x emissions in terms of pounds per ton of feed or ton of lime produced. This is the type of emission data that was needed for the BACT determination, which Lhoist has only now provided with its comments.[34]

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[33] For Lhoist's O'Neal facility, as indicated in the application, Mississippi Lime made an FOIA request and conducted an on-site file review for information held by the Alabama Department of Environmental Management (ADEM). This yielded the information used in the applicant's analysis. The FOIA request did not provide any additional information, including the data now provided by Lhoist with its comments. Most significantly, none of the information that was obtained indicated that SNCR technology was being used on the kilns at Lhoist's O'Neal facility.

For example, for the "Basic Data" provided in the Monitoring Report to ADEM for October 2009 for Kiln 2, for "Control Device" the reports provided by Lhoist indicate Baghouse with CEMS, TECO NO_x Analyzer Model 42i-HL, Serial No. 0611516313.

[34] It is questionable whether Lhoist would have provided NO_x emission data in pounds per ton of lime if it had been requested earlier. This is because such data would enable the production of the O'Neal facility to be back-calculated from the emissions data that was provided. In the lime industry, production data is generally considered confidential business information (CBI) as it allows competitors to assess the unused capacity of facilities and modify its prices accordingly.

In this regard, when adopting the BART FIP for Arizona, USEPA observes that LNA [Lhoist North America] has provided a summary of CEMS emissions data, but considers it CBI since it also includes lime production data. We have included a summary of lbs/ton values from the testing period in our docket for the final rule because the BART limit is established in lbs/ton. We have not included the mass emission rates from the testing period, since including both lbs/hour and lbs/ton data in the docket would allow for back calculation of lime production data. 79 FR 52438 (September 3, 2014).

48. The Project Summary, Footnote 96, page 38 and 39, states:

> The NO_x emissions of [a] lime kiln can be affected by a number of factors independent of the purposeful operation of the kiln to reduce NO_x emissions. First, the NO_x emissions of a kiln may be affected by the operating rate of a kiln and the type of lime that is being produced. Emissions may also be affected by changes in the sources of the limestone and fuel being used in the kiln. Then, on a short-term basis, there is normal variation in the composition and condition of stone feed and fuel and in the operation of the limestone preparation system, the fuel preparation and feed system, the calcination process in the kiln, the preheater, etc. Then, on a longer-term basis, the NO_x emissions of a kiln are affected by the condition of the various components, most critically as related to the length of time since routine maintenance was last performed. This is because of gradual wear and drift of the various systems and components, such as mills, feed devices, kiln seals, refractory, etc., between maintenance. All these factors combine to affect both the fuel combustion process in the kiln and the thermal efficiency or heat losses from a kiln. That is, they determine how much fuel must be fired in the kiln and how well it can be combusted to minimize formation of NO_x.

Poor maintenance of process and control equipment is not justification for failure to establish achievable and enforceable emission limits.

In this comment, Lhoist misrepresents the statement from the Project Summary that is cited. This statement merely acknowledges the normal variation in operation that occurs at a lime kiln. This statement does not suggest that higher BACT limits must be set to address the possibility of poor maintenance of process and control equipment. The comment does not show that is inappropriate to address normal variation in the operation of a lime kiln. Indeed, the emission data that Lhoist has supplied with its comments shows that there is variation in the NO_x emissions of kilns that continue even when they are equipped with SNCR.

49. The Project Summary, Footnote 98, page 39, states:

> The data for actual NO_x emissions that is critical for selecting the limit that is set as NO_x BACT for the proposed kilns are the higher emission rates. This is because BACT limits are to be reasonably achievable. In the absence of information showing that a high measured emissions rate was "higher than necessary", e.g., it reflects poor operation of a kiln system as related to NO_x emissions, it is indicative of the lowest emission rate that may appropriately be set as BACT for NO_x. This is because emission rates above such values were not measured and presumably never occurred.
>
> … The second and third highest NO_x emission rates measured at existing kilns are both 3.45 pounds per ton of lime (Chemical Lime, O'Neal, Kiln 2, June 15, 2007, and MLC, Verona, September 2008). These emission rates are only slightly below 3.5 pounds per ton. Moreover, the applicable NO_x emission rate for Chemical Lime, O'Neal, Kiln 2, is 3.69 pounds/ton, so that the NO_x

emissions measured during the June 2007 test were only 93.5 percent of the applicable rate.

As noted in Lhoist's comments regarding Tables 3-1, 3-2 and 3-4, the "actual emissions" of the O'Neal Kilns are significantly less than represented in these tables. The arguments presented in the Project Summary also ignore the control technology analysis contained in Arizona FIP, EPA-R09-OAR-2013-0588, concerning the technical and economic feasibility of applying SNCR for NO_x control and the use of low sulfur fuels and flue gas desulfurization for SO_2 control.

As already discussed, the new information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed facility.

50. The Project Summary, Footnote 99, page 39, states:

> Considered as a whole, in the absence of further explanatory information concerning the various lime kilns and the testing conducted at those kilns, only a very simple conclusion should be drawn from the data on actual NO_x emissions of lime kilns. It is common for the measured NO_x emissions of a lime kiln as determined by a stack test to be significantly lower than the limit that applies to the kiln. Overall, considering the information in Table 3-2 for the measured NO_x emission rate of lime kilns, the average NO_x rate is 79.1 percent of the applicable limit.

No justification is provided for setting the BACT limit for NO_x for Mississippi Lime at a level that is 20 percent greater than the average level achieved in practice. Further, as Table 3-2 does not include all "Compliant" emissions data (such as the available CEMS data from Lhoist O'Neal or Lhoist New Braunfels or the test data incorrectly considered non-compliant from Table 3-3), the "average NO_x rate" used as the baseline for the average was incorrect and must be updated if methodology is to be used to establish the limit.

As already discussed, the new information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed plant.

51. The Project Summary, page 40, states:

> As already mentioned, some of the NO_x emission data for lime kilns that was assembled was from stack tests during which the applicable CO limit was exceeded. This emission data is presented in Table 3-3. In particular, for Graymont's lime plant in Superior, Wisconsin, a series of tests was conducted for Kiln 5 after an emission test showed exceedances of the applicable CO limit with poor combustion conditions in the kiln. Again, as with the other emission test reports, the available information does not indicate the specific cause of poor combustion, e.g., improper operation, failure of operational instrumentation or flawed operating procedures. This test data highlights the relationship that exists between the NO_x emissions and CO emissions of a lime kiln. There is a trade-off between NO_x and CO, wherein poor combustion with higher levels of CO emissions will be accompanied by lower levels of NO_x emissions. These "noncompliant" tests

> confirm that permit limits for CO emissions may act to constrain the permit limits that may be set for NO_x emissions. Moreover, the emissions of the proposed kilns will be further constrained as they are also subject to BACT for GHG emissions. This is not the case for the new lime kilns for which data on actual NO_x emission was collected. As a consequence, Mississippi Lime will not be able in practice to "detune" or operate the proposed kilns less efficiently to comply with the limit that is set as BACT for NO_x. This is possible at the other new kilns. Moreover, for the "older" new kilns, the thermal efficiency of the kilns may be lower and GHG emissions may inherently be higher so that lower NO_x limits may in practice be achievable for those kilns.

Neither Illinois EPA nor Mississippi Lime have provided any data to support the assertion that there is a direct relationship between CO and NO_x emissions from preheater rotary lime kilns. In fact, numerous lime kiln operators are required to meet CO, NO_x and SO_2 emissions limits, simultaneously, as demonstrated by CEMs data. The applicant should provide a demonstration that there is an exchange or trade-off between CO and NO_x emissions. The Illinois EPA and the public could then evaluate whether such a trade-off occurs and if there is an environmental benefit to increased CO or CO_2 emissions relative to decreased NO_x emissions.

The existence of a relationship between CO and NO_x emissions of combustion units is commonly recognized.[35] It reflects the fact that the combustion conditions that generally result in good combustion efficiency and low CO concentrations, i.e., high temperatures and ample oxygen, facilitate formation of NO_x. Accordingly, low-NO_x combustion techniques must be specifically designed to facilitate good combustion while at the same time lowering NO_x emissions. This commenter is certainly aware of this inverse relationship. According to an ADEM memorandum dated July 20, 2007, summarizing a July 18, 2007, meeting held with CLC (now LNA) and states, "As discussed during permitting, process control to reduce NO_x increases CO."[36] Furthermore, an enforcement order against LNA prompted the Texas Commission of Environmental Quality to issue an order that included the requirement for LNA to train "kiln operators and technicians on emission interaction between carbon monoxide and nitrogen oxides…"[37]

52. The Project Summary, Footnote 101, page 40, states:

> As a general matter, air pollution control agencies do not receive the detailed emission data that is collected by continuous emissions monitoring systems. The data that is reported to agencies involves exceedances of applicable standards and operation of the monitoring system. The data for actual emissions

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[35] For example, refer to *In Re Cardinal FG Co.*, 12 E.A.D. 153, 169 (2005); Arnold W. Reitze, Jr., Air Pollution Control Law: Compliance & Enforcement at 272 (2001) ("fuel rich mixtures and lower combustion temperatures will reduce NO_x formation, but will increase CO and HC production.").

[36] Alabama Department of Environmental Management. http://app.adem.alabama.gov/eFile/ File Name 2790_411-0039_117_07-20-2007_MEMO_MOG_NOX_CO_AND_SO2_MTG.tif. Accessed February 5, 2015.

[37] Texas Commission on Environmental Quality. Commission Issued Orders. TCEQ Docket Number 2012-1862-AIR-E. http://www14.tceq.texas.gov/epic/CIO/ Accessed February 6, 2015.

> for periods when an emission unit is in compliance, which is voluminous, is retained by the source.

The data that was assembled for Lhoist's O'Neal plant was available because it was submitted by Chemical Lime, the previous owner of this plant, as part of the support for an application for a revision to a permit.

Semi-annual "deviation" reports are available to the public and could be used to verify that a source is in compliance (achieving) applicable short-term and longer-term emission limits. USEPA's ECHO database also contains information that could be used to determine compliance or non-compliance with applicable emission limit at by an applicant that was interested in obtaining such information.

As noted in my earlier comments on Table 3-1, 3-2 and 3-3, the Lhoist O'Neal emission data cited in the Project Summary includes periods before SNCR controls were installed on the kilns. The BACT analysis must be updated to reflect current (post 2007) emissions data.

As already discussed, the information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed facility. The information that was considered included the information in this comment, which provides further background and explanation on the emission data that had been obtained for Lhoist's O'Neal facility. This clarification was critical as Lhoist has now identified the use of SNCR technology and confirmed its effectiveness. Moreover, as already mentioned, this information was not previously available to the Illinois EPA from sources, which did not and would not necessarily indicate that SNCR was being used or provide data for NO_x emissions in pounds per ton of lime.

In particular, deviation reports would only provide information on NO_x emissions in pounds/ton if there were applicable limits in pounds/ton that applied to an emission unit. For Lhoist's O'Neal plant, Kiln 1 is only subject to a NO_x limit of 3.5 pounds/ton; Kiln 2 is not subject to a limit in pounds/ton. USEPA's ECHO Database does not include detailed information on the nature of violations.

53. The Project Summary, Footnote 102, page 40, states:

> As compared to continuous emission monitoring, stack testing is commonly characterized as a snapshot of the emissions of a unit. This is because stack testing narrowly addresses the emissions of an emission unit at a specific time under particular operating conditions.

This is further justification for requiring Mississippi Lime to use CEMs data when establishing their BACT limit. As mentioned previously, CEMS data is available and must be considered in establishing achievable BACT emission limits rather than a simply reliance on stack testing which may be "characterized as a snapshot of the emissions of a unit."

As applied to the SO_2 and NO_x emissions of the proposed kilns, the Illinois EPA agrees with the conclusion made by Lhoist in this comment. Given the nature of SO_2 and NO_x emissions of lime kilns, the size of

these kilns and the feasibility of continuous emission monitoring for SO_2 and NO_x, it is appropriate that the BACT limits for these kilns to generally be set as 30-day averages, with compliance determined by continuous emission monitoring.

54. The Project Summary, pages 40 and 41 states:

> In addition to data from stack tests, the NO_x emissions data that was assembled also includes data from continuous monitoring systems for two kilns. This data is presented in Table 3-4. This data provides important further insight on the NO_x emissions of lime kilns as it directly addresses the variation in emissions of the subject kilns. This monitored data confirms substantial variation in NO_x emissions of lime kilns over the course of a year. During the course of a year, the monthly, 30-day average NO_x emission rates of one kiln range from 55 to 132 percent of the applicable limit. The NO_x emission rates of the second kiln range from 46 to 123 percent of the applicable rate. In addition, this data directly confirms that a NO_x limit lower than 3.5 pounds per ton should not be set for the proposed kilns. For both kilns, the highest NO_x emission rates exceed 3.5 pounds per ton (4.63 and 4.555 pounds per ton). The second highest rates are consistent with a BACT limit of 3.5 pounds per ton (3.06 and 3.52 pounds per ton).

It appears Mississippi Lime has chosen to cite only CEMS data from sources with high emission rates and which are failing to meet applicable emission limits during some period of time. A considerable volume of CEMS data is available for kilns that are demonstrating continuous compliance with applicable emission limits set at levels much lower than the proposed BACT limit. This data is available for kilns operating with and without SNCR.

The only CEMS data that was obtained was for Lhoist's O'Neal facility, the source that submitted this comment. As discussed, detailed CEMS data is not readily available to the public. In this particular case, some detailed NO_x CEMS data was available for Lhoist's O'Neal facility because Lhoist submitted it to ADEM with a request for a revised permit. That data, as summarized by Lhoist in that application, supported its request for a revised permit with longer compliance time periods.[38]

55. The Project Summary, page 41, states:

> In conclusion, information on the required and actual performance of lime kilns for emissions of NO_x shows that Mississippi Lime has proposed a stringent limit as BACT for NO_x. This information does not show that an emission limit better than that proposed by Mississippi Lime is achievable. It is appropriate that the NO_x BACT limit for the productive operation of the proposed kilns be set at 3.5 pounds per ton of lime produced, 30-day average.

[38.] Mississippi Lime indicates that the FOIA and on-site file search that it conducted at the Alabama Department of Environmental Management (ADEM) yielded the information used in its application. This effort did not provide any additional information, including the further data provided by Lhoist with its comments.

The available emission data do not support this conclusion. Enforceable emission limits much lower than the proposed BACT limit of 3.5 lbs NO_x/ton of lime have been established by the States of Alabama and Texas and by the USEPA for the State of Arizona. Compliance with these more restrictive emission limits has been demonstrated by use of continuous emission monitoring and stack testing.

As already discussed, the new information that Lhoist provided in its comments has been considered as part of the further analysis that was conducted before issuance of the permit for the proposed facility. One of the purposes of a public comment period is to solicit information that is relevant to the proposed determination, as has occurred in this case with the information that Lhoist has submitted with its comments.

56. The Project Summary, page 42, Table 3-1. Graymont, Pennsylvania, Kiln 6 (PA-0241, 2004). Permit PA-0241 requires that a CEMS be utilized for Kiln 6. Regardless of the original BACT limit, Mississippi Lime's application was deficient in that it failed to evaluate this CEMS data to determine if actual emission levels achieved for the nearly identical 1200 tons/day preheater rotary kiln were substantially lower than the enforceable BACT limit.

In fact, Mississippi Lime indicates that it attempted to obtain monitored NO_x emission data for Graymont Kiln 6. Mississippi Lime's consultant performed an on-site visit to the Pennsylvania Department of Environmental Protection (PDEP) in March, 2012 in an effort to obtain this emissions data. The data submitted to the PDEP that was available consisted of excess emissions reports and CEM cylinder gas audits. This is because PDEP does not normally receive detailed emission data measured by CEMS.

More importantly, this comment does not suggest that the NO_x emissions data from Graymont Kiln 6 would still be useful for the BACT determination for the proposed plant. Since that kiln does not have SNCR, it would not provide insight on the levels of NO_x emissions that are available from a lime kiln with this technology.

57. The Project Summary, Table 3-1, page 42, does not indicate that the kilns operated by Greer Lime, Pendleton, West Virginia, were considered in developing the BACT limit for the proposed kilns (West Virginia Operation Permit Number: R30-07100001-2004). Greer Lime operates two rotary kilns designated 4-RK-1 and 4-RK-2. Kiln 4-RK-1 has an effective limit of 1.8 lbs NO_x/ton lime (30 lbs NO_x/hour at 400 tons lime/day). Kiln 4-RK-2 has an effective NO_x limit of 2.0 lbs/ton lime (42 lbs NO_x/hour at 500 tons lime/day). The operating permit requires annual emission testing unless the tested NO_x emissions are less than 90 percent of the NO_x limit (Permit Condition 6.3.5). Thus, test data should be publically available to confirm that these BACT limits are being achieved. Mississippi Lime should update the BACT analysis to include the BACT limits for the kilns at Greer Lime, as well as the results of emission testing for these kilns.

The information or "observation" provided by this comment has been investigated. This investigation has not yielded informative that contributes to the final BACT determination for NO_x. This is because the Illinois EPA has been unable to obtain information regarding the design or operation of these kilns that explains why these emission

rates are achievable.[39] Such information was not provided by Lhoist in its comments. In addition, nothing in Lhoist's comments would suggest that this emission rate is achievable by a new modern lime kiln even with SNCR. In this regard, Greer Lime is not subject to BACT and its limits for NO_x appear to simply reflect data for emissions provided by Greer Lime early in its permitting history.[40]

58. Draft Condition 2.2.4 would improperly state that NSPS for Coal Preparation Plants, 40 CFR Subpart Y, is not applicable because the proposed facility will not prepare more than 200 tons of coal per day by breaking or crushing. The permit should indicate this NSPS is applicable for the coal processing and conveying equipment at the facility, including crushers, storage systems, transfer and loading systems, and coal storage piles. This is because the facility will process more than 200 tons of coal per day. (Draft Condition 2.1.4 would limit the usage of solid fuel of the facility to 263,000 tons per year, which, based on continuous operation, is equivalent to 720 tons of fuel per day.) The fact that the kilns will be "direct fired" does not exclude other emission units that prepare or process coal at the facility from the applicability of 40 CFR 60 Subpart Y, as claimed by Mississippi Lime in the application, Volume 1, page 8.

As a result of the reevaluation conducted in response to this comment, the issued permit indicates that the various coal handling and storage operations at the proposed facility, other than the fuel mills, will be subject to 40 CFR Part 60 Subpart Y. As this comment correctly observes, the facility will process more than 200 tons of coal per day. In addition, even though that fuel mills will not be subject to the NSPS because the kilns will be direct-fired,[41] this does not mean that other coal handling and storage operation at the facility will not be subject to this NSPS. These operations will located at a coal preparation and processing plant as defined by 40 CFR 60.251 because coal will be

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[39] Discussions with staff at the West Virginia Department of Environmental Protection indicates that based on the periodic emission testing required by the Title V permit, the Greer kilns are complying with the applicable limits for NO_x emissions, i.e., 42.0 pounds/hour for the larger kiln, whose capacity is identified as 500 ton/day, and 30.0 pounds/hour for the smaller kiln, whose capacity is identified as 400 tons/day.

[40] The information in Lhoist's comments for the lime kilns at its Nelson, O'Neal and New Braunfels facilities indicates that, absent use of add-on SNCR technology, the NO_x emissions rates of these kilns are or would be much greater that the NO_x emissions rates that are required for the kilns at Greer Lime. Even with SNCR, the NO_x emissions of the kilns at the Nelson facility will exceed the rates that are achieved by the Greer kilns. This indicates that those NO_x emission rates are not achievable by modern lime kilns. It is apparent that there is some aspect of the design or operation of the Greer kilns that results in lower NO_x emissions. Perhaps, given the age of the Greer kilns, it is due to the design of the combustion air system with accompanying lower fuel efficiency. Alternatively, maybe Greer manufactures lower-quality lime products for particular markets.

[41] In lime kilns, solid fuel is prepared for firing in the kiln by being ground in a fuel mill. In a direct-fired kiln, the air stream from the fuel mill is used to directly carry the ground fuel into the kiln without intermediate storage of the fuel. Because the gas stream from the mill is introduced into the kiln, the mill is regulated with the kiln and is not separately regulated by 40 CFR 60 Subpart Y.

In an indirect-fired kiln, the ground fuel from the fuel mill is temporarily stored before then being fed to the kiln. Because there is an emission point from the fuel mill separate from the kiln, the fuel mill at an indirect-fired kiln is regulated as a crusher under 40 CFR 60 Subpart Y.

prepared at the facility for use in the kilns by crushing in the fuel mills.

59. The Illinois EPA has not quantified fugitive emissions of methane from the handling of coal at the Mississippi Lime facility. The draft permit is deficient in failing to address BACT for these greenhouse (GHG) emissions.

It is appropriate to assign the emissions of methane from the handling of coal to the mine and coal preparation plant where coal is initially handled.[42] In this regard, this comment does not identify any means by which such emissions could reasonably be quantified at a source that uses coal, such as the proposed facility. Perhaps more importantly, this comment does not identify any control technology that could be used to reduce those emissions of methane at this facility.

60. Draft Conditions 2.2.11 and 2.3.11 would provide Mississippi Lime "Operational Flexibility." However, the draft permit would not explain how this flexibility will be reconciled with changes to the regional inventory and monitored ambient background concentrations that were included in the modeling analysis. These changes are particularly critical as Page 12 of the Project Summary states that the compliance margin for the $PM_{2.5}$ annual NAAQS was less than 1 µg/m3. Also, Draft Conditions 2.2.11(a), 2.3.11(a) would not define how long the period of "initial operation of the plant" may be. If it is intended to be the same period as identified in Draft Condition 1.10(a) (one year after initial start of operation of the kiln), this should be stated.

This comment does not support changes to the cited conditions of the permit. These conditions specifically provide that the effect on air quality of any changes that take place using the flexibility provided by this condition must be to reduce such impacts. Accordingly, this flexibility would not threaten air quality levels that are higher than those that have been addressed.

61. Given the underlying requirement for limestone and solid fuel handling (Section 2.2) and lime processing and handling (Section 2.3) to operate using "Good Air Pollution Control Practices," written operations procedures, similar to those required by Condition 2.1.5, should be required for these units.

The permit appropriately addresses these material handling and processing operations. As a general manner, all emission units at the plant are required to be operated and maintained in accordance with good air pollution control practice by Condition 1.1.4-1. For the lime kilns, this requirement is further developed by Condition 2.1.5 with a

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[42] According to Chapter 4.1.1.1 of the 2006 *Guidelines for National Greenhouse Gas Inventories* prepared by the International Panel on Climate Change, seam gas (methane and carbon dioxide) is released when "coal is exposed and broken during mining." Although "coal normally continues to emit gas even after it has been mined," the majority of the gas would be released prior to its arrival at the proposed site. USEPA ultimately decided that coal suppliers would not be required to provide GHG reports because the emissions reported through were being reported by other subparts. For the proposed lime plant, CO_2e emissions from coal (which include methane) are calculated using the appropriate equations in 40 CFR part 98 Subpart C, General Stationary Fuel Combustion Sources.

requirement for implementation of written operating procedures. As is apparent from the text of Condition 2.1.5, the focus of this further development is the startup, shutdown and malfunction of the kilns. Such periods are inherent in the operation of a kiln, since a kiln cannot be simply "turned on." Even if a kiln were turned off, it would continue to operate generating emissions until it cools. The concerns posed for the proposed kilns by startup, shutdown and malfunction, support the development and implementation of written operating procedures for the kilns. Such concerns are not present for the material handling and processing operations at the plant, which can essentially be turned on and off.

62. Draft Condition 2.1.8-1(c) would allow Mississippi Lime to measure and record exhaust gas concentrations using gas tubes or equivalent techniques during extended CEMS outages. However, the permit does not define "extended outages". As CEMs will be the ongoing compliance mechanism to assure compliance with the SO_2 BACT limits, it is not acceptable to leave the term "extended outages" undefined. The draft permit and Project Summary are also deficient in identifying how the twice per shift requirement for collection of SO_2 emissions data "by gas tubes or equivalent techniques" assures an adequate compliance demonstration of the 1-hour and 3-hour SO_2 BACT emission limits. In addition, as BACT limits for NO_x and CO also rely upon CEMs data for demonstration of compliance, the permit should define an acceptable alternative compliance demonstration methodology and the corresponding frequency for collection of relevant emissions data.

Upon further consideration in response to this comment, the issued permit requires that the continuous emission monitoring systems be operated at all times. Accordingly, it need no longer address extended outage of monitors, as would occur due to monitor malfunction. Accordingly, Draft Condition 2.1.8-1(c) has not been carried over to the issued permit.

63. Draft Condition 2.1.11 would establish a default period of four years after the initial startup of the kiln as the time period for establishment of an alternative limit for GHG emissions. This four year period is simply justified as needed to "go well beyond the initial period of operation of the kilns". The draft permit also would provide for an additional two year extension to this four year period (per Draft Condition 2.1.11(b)(ii)(B)). To satisfy the procedural requirements of the PSD permit program, the evaluation required under Draft Condition 2.1.11(b)(ii)(A) is subject to public comment procedures (if Mississippi Lime proposes to deviate from the 2,630 lbs/ton lime limit) and is required to follow complete top-down BACT provisions, consistent with PSD permit revision procedures (PSD Permit Modifications: Policy Statement on Changes to a Source, a Permit Application, or an Issued Permit and on Extensions to Construction Schedules," June 1985, USEPA).

As discussed in response to another comment, as this evaluation of GHG emissions would lead to a change in a BACT limit, a public comment period, with opportunity for public input, on the proposed change would need to precede the change to the BACT limit.

Incidentally, this opportunity for public comment would not be required for the reason cited by this comment. This is because the guidance

document cited by this comment was only a draft document and has subsequently been withdrawn by USEPA.

64. Condition 2.2.3-1(c) of the permit should state that the air pollution control operating permit for the existing limestone crushing plant at the site will be rescinded when the proposed lime facility begins operation.[43]

The further provision requested by this comment is not needed. Condition 2.2.3-1 clearly states that the units at the existing limestone crushing plant shall cease operation and be removed from service when the proposed facility begins operation. This directly acts to terminate the authorization for operation of this crushing plant provided by its air pollution control permit. Accordingly, it is not necessary for any further action to be taken to terminate that authorization, such as requiring the source to withdraw that permit.[44]

65. The permit should expressly state that there will be no other emissions from the underground limestone mine other than those identified in Section 2.2 of the permit.

The underground limestone mine associated with the proposed plant is appropriately addressed by the permit. The permit addresses the limestone crusher, which is located within the mine, and the conveyor that will transport material from the crusher to the proposed plant. These are the principal emission units in this mine. It would not be appropriate to add the provision requested by this comment to the permit. This is because it would to act to preclude operation of the mine since it is not possible to prevent any emissions from the actual mining operations. While the Mine Safety Health Administration addresses emissions from these mining operations with requirements to protect worker health, these measures do not reduce emissions from mining operations to zero.

66. Draft Condition 2.2.3-2(a) would provide that:

> The PM emission from affected limestone handling operations that, as they are "processed stone handling operations," are subject to the NESHAP, 40 CFR 63 Subpart AAAAA, or the NSPS, 40 CFR 60 Subpart OOO (see Draft Conditions 2.2.3-3(a) or (b)), shall comply with the applicable limits specified by the NSPS and NESHAP.

However, this would not apply the BACT limit of 0.005 gr/scf to the processed stone handling operations. Under the NESHAP or NSPS, as addressed by Draft Condition 2.2.3-3(c), these operations are subject to a PM limit of 0.014 gr/dscf pursuant to 40 CFR 60.672(a) and (b) and Tables 2 and 3 to 40 CFR Part 60 Subpart OOO and 40 CFR 63.7090(a) and

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[43] Based on a review of the operating permit for the existing limestone crushing plant (Permit No. 10050062, dated February 16, 2012), it is understood that the following equipment will be removed from service when the lime facility begins operation: Three crushers; five bins; three screens; 41 conveyors; and one barge load out.

[44] A requirement in Condition 2.2.3-1 for further action by either the Illinois EPA or Mississippi Lime to terminate the authorization for operation of the existing crushing plant would also be inappropriate. This is because it would suggest that the permit issued for the proposed lime facility is inadequate to address the transition from the existing plant to the new facility.

Table 1 to 40 CFR 63 Subpart AAAAA. While this may be true, the NSPS/NESHAP limit for PM, 0.014 gr/dscf, should not be confused with the BACT limit of 0.005 gr/dscf.

The discrepancy identified by Lhoist in this comment has been addressed in the issued permit. In the issued permit, Condition 2.2.3-2(a) provides that any stack emissions from processed stone handling operations are also subject to a PM limit of 0.005 gr/scf.

This comment has also led to the correction of another discrepancy in the draft permit. The limestone feeder on each kiln system is an aspect of the operation of the kiln and not a discrete limestone handling operation. Accordingly, the issued permit no longer addresses these feeders on the kilns as limestone handling operations.[45]

67. The BACT determination for PM emissions from lime handling operations in Draft Conditions 2.3.3-2(a)(iii), (b)(iii), and (c)(iii) has been significantly relaxed when compared to the original 2010 permit. The data presented by the Illinois EPA regarding the average cost effectiveness, and Clearinghouse data presented by the applicant (Appendix H, with the most recent entry dated 2008) would suggest that a lower BACT limit is appropriate. The Project Summary, page 74, is particularly difficult to follow for evaluating Step 4 of the BACT analysis for Processing and Handling of Lime given inappropriate references to different fuels and SO_2 cost removal efficiency. Furthermore, in a 2011 permit for Universal Cement, the Illinois EPA established BACT for units handling cement, a material similar to cement, as 0.004 gr/dscf.

For PM emissions, the original permit erroneously set the filtration level for the lime handling operations at 0.0002 gr/scf.[46] The limit that was actually proposed in the application was 0.005 gr/scf. As generally discussed in the Project Summary, Mississippi Lime submitted further information to support the correction of this error and a BACT limit for PM emissions set at 0.005 gr/scf. The impacts that would result from requiring more efficient filter technology, as would be necessary to ensure achievement of the original, incorrect emission limit of 0.0005 gr/scf and a limit at an intermediate level, 0.002 gr/scf, were evaluated. The evaluation showed that the cost impacts of the alternative filter technologies would be excessive. This is in large part because filters are very effective in controlling PM emissions from lime handling operations so that additional reduction in PM emissions is small compared to the additional cost.

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[45] The two limestone feeders at the top of the kiln systems, which were identified as EP12 and EP13 in the draft permit, would be the only "limestone handling operations" served by control devices. Accordingly, they would be the only operations that would potentially have been affected by discrepancy identified in this comment. In fact, the baghouses that serve to control these feeders (CD6 and CD7) are the baghouses that control the kilns. The PM emissions of the kilns and these baghouse are addressed by BACT limits in pounds/ton of feed to the kiln and are not by the emission rate in gr/scf.

[46] The PM limit in the original permit, 0.0002 gr/scf, was clearly erroneous. This is one seventieth of the limit, 0.014 gr/scf, that is set for new operations handling aggregate or non-metallic minerals by the NSPS, 40 CFR 60 Subpart OOO. A value of 0.002 gr/scf for the PM limit from lime handling operations was not mentioned anywhere in the application material. This limit also was not mentioned in the project summary. It is not found in the USEPA's *RACT/BACT/LAER Clearinghouse.*

In light of the observation concerning the BACT limit set for Universal Cement, the BACT limit in the issued permit for PM emissions on baghouses on lime handling operations has been set at 0.004 gr/scf. The circumstances of Universal Cement were not identical to those of Mississippi Lime, i.e., a limit of 0.004 gr/scf was needed for the air quality analysis for that project. However, this limit should also be achievable for lime handling operations at the proposed plant using well-designed filters using conventional filter media.[47]

Incidentally, as observed by this comment, several sentences that were unrelated to particulate emissions were inadvertently included in the discussion of particulate control in the Project Summary, p. 75. However, the fact that these sentences were erroneous was clear as they referred to alternative fuels and SO_2 emissions.

68. The BACT determination for barge loadout in Draft Condition 2.3.3-2(c)(ii) is deficient for a number of reasons. The BACT determination for barge loadout, 20% opacity, appears to be in conflict with material submitted by Mississippi Lime that describes capabilities for dust free loading. (Refer to material from Dust Control and Loading Systems, Inc., included in the application.[48]) Mississippi Lime should be required to employ dust free loading. The Project Summary, page 68, also states that, "20% opacity reflects at least 90 percent capture of emissions," though this 90 percent capture is unsubstantiated in the record for the draft permit. The permit record for barge loading is deficient in that there are no comparable BACT determinations identified in the Project Summary for other barge loading operations. The Project Summary, page 68, suggests that the emission factor for barge loading is greater than that of truck/rail loading despite materials submitted by the applicant which would suggest that the emission factor is lower (page 1-3, December 4, 2013 Addendum to Supplemental Remand Analysis). A revision of the emission factors for barge loading may require revised modeling.

This comment mischaracterizes the circumstances for barge loadout. To minimize particulate emissions from loading barges, loading must be conducted using dust controlled loading spouts with extended heads, as described in the material in the application from Dust Control and Loading Systems, Inc., cited by this comment. However, as explained in the Project Summary, page 72, "…some particulate emissions would not be captured and would be discharged directly to the atmosphere." As explained in the previous paragraph with regard to similar equipment used for loading trucks and railcars, "when the loading spout is being extended or retracted, these measures may not capture some particulate emissions."

Notwithstanding the claim in this comment, the material from Dust Control and Loading Systems that was included in the application does not show that barges can be loaded without any particulate emissions. This material was an excerpt from a product brochure from Dust Control

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[47] A similar change was also made in the BACT determination for limestone and fuel handling operations. In Condition in 2.2.3-2 in the issued permit, baghouses are subject to a PM limit of 0.004 gr/scf.

[48] Mississippi Lime's application, *Lime Processing and Addendum to Supplemental Remand Analysis*, dated December 4, 2013, Appendix J, pages 6 through 9.

and Loading Systems that describes its heavy duty loading spouts, which are the type of spout that would be used for loading barges. The fact that these spouts are described as "dust free" at certain points in this sales brochure does not show that load out using these spouts can be conducted without any emissions. Rather the term "dust free" is being used in the context of marketing literature. At most, this term should be considered to indicate that the heavy duty loading spouts currently being manufactured by Dust Control and Loading Systems are designed to reduce loss of dust during load out. As such, these load out spouts will have lower particulate emissions than spouts that are not designed to reduce loss of dust. This marketing brochure certainly does not constitute a performance guarantee that load out can be conducted without emissions, as suggested by this comment. Indeed, elsewhere in this material, Dust Control and Loading Systems describes its current models of heavy duty loading spouts as "virtually dust free."[49] This negates any suggestion in this material that loading can be conducted dust or emission free. It also creates significant uncertainty as to the nature and level of emissions that may accompany load out, given the subjective nature of the term "virtual."

As observed by this comment, no other BACT determinations for barge loadout of lime were provided. That is because none were identified. (None were any provided by Lhoist with its comments). This is not unsurprising as lime it is more common for lime to be transported by truck and rail.[50] Accordingly, as discussed in Mississippi Lime's December 4, 2013 submission, its BACT demonstration for the proposed barge loadout operation reflects a reasoned analysis considering equipment and processes for loadout of the lime and the loadout of grain, for which emission factors are available for both truck/rail and barge loadout.

Finally, the Project Summary does not suggest that the emission factor for the barge loadout is greater than that of truck or rail loadout, as this comment suggests. In fact, the Project Summary indicates that the percentage of uncaptured emissions is higher for barge loadout compared to enclosed truck and rail loadout, which is not the emission factor. As explained in the Project Summary, page 72, "Since a barge cannot be enclosed during loadout and this operation would be directly impacted by the wind, the percentage of the emissions from barge loadout that would be uncaptured would potentially be much greater than for truck and rail loadout." However, as also clearly stated, "The factors for uncontrolled emissions of particulate emission from loading of barges, in the absence of any control measures, are less than those for loading of trucks and railcars. In barge loading, material is being placed in a

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[49] In this brochure, Dust Control and Loading Systems states:

> Our field proved design has outperformed the best that the industry has to offer. Products such as alumina, bentonite, calcined coke, phosphate rock, sodium sulfite, soda ash, potash, and magnesium oxide are now loading into ships at high rates, virtually dust free, and have far exceeded our customers' expectations, Installation costs have shown to be recouped within a year of operation in product recovery as well as in reduced maintenance and service costs.
> Dust Control and Loading Systems, *Product Line Overview*, Page 10.

[50] BACT determinations for barge loadout would only be expected for new lime plants located on major river systems. Existing plants that ship lime by barge and add new kilns would utilize the existing facilities for loadout by barge.

larger cargo space, which is much deeper and broader than the cargo space of a truck or rail car."

69. In Draft Condition 2.3.6, the emission limit for $PM_{2.5}$ for Emission Unit CD 64, a handling system for quick lime, 0.0056 lb/hour, is 20 percent of the PM_{10} limit, 0.028 lb/hr. The ratio of $PM_{2.5}$ to PM_{10} for the majority of the other "CD" Emission Units addressed by this condition is 50 percent. The permit record does not explain this difference. A higher $PM_{2.5}$ emission rate for CD 64 would require revised modeling.

The ratio of PM_{10} and $PM_{2.5}$ emission limits for CD 64 noted in this comment is a consequence of the scope of Emission Unit CD 64, which consists of a bin and a conveyor. Bin emissions are calculated using methodology from AP-42 (Chapter 13.2.4).[51] Conveyor emissions are calculated using methodology from AP-42 (Chapter 11.17).[52] Even though other emission points include bins and conveyors, the majority of emissions from CD 64 are from the bin, resulting in an overall $PM_{10}/PM_{2.5}$ ratio that is lower than 50 percent. For other emission units that include both bins and conveyors, the effect of emission from the bin is not as significant.

70. For Draft Condition 2.3.6, Emission Limitations, the basis for the emission limits is in error. In the application, Appendix I, Table I-2 "Control Device Information" provides air flows for the non-kiln system control devices. Appendix I "Table I-3 Control Device Emissions at Various Grain Loading Levels" reportedly provides emission rates of these same control devices based on various grain loadings, including the proposed BACT limit of 0.005 gr/scf. However, the emission rates in Table I-3 do not appear to be correct. For example, Table I-2 lists the airflow for Control Device 5 as 1,000 acfm. At a grain loading of 0.005 gr/scf, and assuming acfm is equal to scfm for this emission unit, the calculated PM emission rate is 0.188 ton/year (1,000 scfm @ 0.005 gr/scf, with continuous operation since it is not limited to a number of hours per year). However, the draft permit would set the allowable limits as 0.5563 and 0.3070 tons/year for PM and PM_{10}, respectively. These limits would both be above the allowable BACT limit of 0.005 gr/scf. Changes to the calculations for PM, PM_{10}, and $PM_{2.5}$ emissions may require revised modeling analyses for the NAAQS and PSD increments.

The emission rates in Table I-3 of the application for most emission units were calculated using maximum hourly rates for the amount of material handled, standard emission factors, nominal control efficiencies if the factors were for uncontrolled emissions, and standard speciation data. As observed by this comment, for some units this resulted in emission rates that are higher than actually possible given the required performance of the baghouses, i.e., 0.005 gr/scf. In response to this comment, appropriate corrections have been made in Conditions 2.3.6(a) and (b) of the issued permit to lower the emission

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[51] This method uses a particle size multiplier, k, to calculate the emission factors for PM, PM_{10} and $PM_{2.5}$. The multipliers for $PM_{2.5}$ and PM_{10} are 0.053 and 0.35, respectively, for a $PM_{2.5}$ to PM_{10} ratio of 15 percent.

[52] This chapter provides a PM emission factor for Conveyor Transfers controlled by baghouses. The chapter also includes particle size ratios PM_{10} (55% of PM) and $PM_{2.5}$ (27% of PM) in order to derive emission factors for PM_{10} and $PM_{2.5}$.

limits for those units so that the limits reflect emission rates calculated based on the BACT limit of 0.005 gr/scf.[53]

As the air quality analysis used emission rates for PM_{10} and $PM_{2.5}$ for certain units that were higher than possible with the 0.005 gr/scf limit, the impacts of the proposed plant were "over-stated." For PM_{10} and $PM_{2.5}$, the modeling has already demonstrated that the NAAQS and PSD Increment are not violated at the higher emission rates. With lower emission rates, the air quality impacts will be lower. Therefore, the project does not need to be remodeled.

71. Draft Condition 2.3.7(b)(ii)(B), the BACT compliance demonstration for barge loadout, would provide that these periodic observations shall be one hour in duration. However, the permit record does not appear to address the length of time that it takes to load a barge. This condition should require opacity observations over the entire duration of a barge loading event or the Illinois EPA provide information supporting a conclusion that emissions do not vary over the duration of a loading event.

It is appropriate for the duration of the required opacity observations for barge loadout to be one hour. This is because a barge is loaded in stages, with the barge being moved past the point at which the loading spout transfers lime the barge. One hour will be sufficient to observe the opacity of emissions for one complete "stage" of loading, including loading when a compartment is empty, loading when a compartment is partly filled with lime, and loading when a compartment is almost full. Observations of opacity that are representative of the emissions from the loading of a barge can be obtained from observations for one stage in the loading process. Accordingly, even though the loading of a barge will take approximately eight hours, observations of opacity to verify compliance only need to be at least one hour in duration.[54]

72. The frequency of inspections for the Lime Processing and Handling Equipment in Draft Condition 2.3.8 (at least on a monthly basis) is not consistent with the frequency for the periodic observations for opacity and/or visible emissions in Draft Condition 2.3.7 (once every three

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[53] Condition 2.3.6 in the issued permit reflects the following changes to the limits for emissions of PM, PM_{10}, and $PM_{2.5}$ from the subject units:

- CD 5: PM and PM_{10} emissions limited to 0.0429 lb/hour or 0.188 ton/year.
- CD 15: PM emissions limited to 0.4714 lb/hour or 2.065 tons/year.
- CD 16: PM and PM_{10} emissions limited to 0.6179 lb/hour or 2.706 tons/year.
- CD 18: PM emissions limited to 0.4714 lb/hour or 2.065 tons/year.
- CD 19: PM emissions limited to 0.4714 lb/hour or 2.065 tons/year.
- CD 61: PM and PM_{10} emissions limited to 0.0600 lb/hour or 0.263 ton/year; $PM_{2.5}$ emissions limited to 0.0300 lb/hour or 0.131 ton/year.
- CD 64: PM emissions limited to 0.0600 lb/hour or 0.263 ton/year.

[54] It is also noted that this comment does not show any consideration of the actual manner in which a barge is loaded with lime. This comment only notes the difference between the time that it takes to load a barge and the required duration of opacity observations. However, the duration of observations to verify compliance with an opacity limit is appropriately set based upon consideration of the time needed to obtain representative data for opacity. Otherwise, for units that are subject to opacity limits, "continuous" observation of opacity would be needed at all times that the units are in operation to verify compliance with that limit.

calendar months) given that the emission units in question are subject to hourly emission limit.

This comment does not demonstrate that more frequent inspections or observations are required for Lime Processing and Handling Equipment. The purpose of the observations and inspections addressed by this comment is to have formal verifications of proper operation and compliance on a regular basis. Conditions 2.3.9(c)(i) and 3.3(a) also require Mississippi Lime to keep records to confirm proper of these emission units and their control systems and to identify periods of abnormal operation that might be accompanied by noncompliance. These records serve to address compliance between the formal inspections and observation that are the subject of this comment.

In addition, in response to this comment, the requirements for periodic inspections have been enhanced in Condition 2.3.8 in the issued permit. Mississippi Lime must now indicate whether visible emissions were observed during these inspections. This is information that will be readily determined during these inspections that will assist in the verification of proper operation of the control systems for these units.

73a. The emission limits for Lime Processing and Handling Equipment in Conditions 2.3.6(a) and (b), for units controlled by enclosure and filter systems, have no practical means of a compliance demonstration. Periodic testing of a representative sample of these units should be required in the permit to verify compliance with the BACT limit in gr/scf in Condition 2.3.3-2 and the mass emission limits in Condition 2.3.6, which were used the air quality modeling analysis.

As already discussed, the permit requires that proper operation of these units to control emissions be verified by periodic operational inspections and formal observations using relevant USEPA methods. In response to this comment, to confirm that the these emission units, which are all controlled, have been properly designed and constructed, Condition 2.3.7(c) in the issued permit now requires Mississippi Lime to have performance testing conducted for two of these units, as selected by the Illinois EPA. This testing should be sufficient to provide the basis for ongoing demonstration of compliance. If concerns arise during the ongoing operation of affected unit(s) that warrant emission testing, Condition 2.3.7(c) continues to provide that Mississippi Lime must conduct emission testing for affected units upon request by the Illinois EPA.

73a. For loadout of quicklime and off-specification lime, Draft Condition 2.3.6(b) would provide that the short-term emission limits, in pounds/hour, apply as a block 24-hour average. However, Draft Condition 2.3.9 would not require recordkeeping for these loadout systems as needed to verify compliance with these limits that apply on a 24-hour average. Such recordkeeping is needed for these systems.

In response to the oversight identified by this comment, Condition 2.3.9(d) in the issued permit now requires Mississippi Lime to keep records as needed to verify compliance with the emission limits for loadout operations that apply on a 24-hour average basis. For this purpose, Mississippi Lime may either keep records to show that these limits would not be exceeded based on the maximum duration of operation

in any day or keep records of the actual duration of operation on a daily basis and determine daily emissions considering this data.

74. For the limestone and coal/coke storage piles, the draft permit, while establishing a BACT limit of 10 percent opacity (Draft Condition 2.4.3-2(a)), would not identify control technology measures (as there are for roadways and parking areas, per Draft Condition 2.4.3-2(b)) to minimize PM emissions. Draft Condition 2.4.5 also would not require work practices or other measures that would provide for practical enforceability of the emission limits that apply to the limestone and coal/coke storage piles. This is a deficiency in the draft permit, particularly since these piles contribute the majority of PM_{10} and $PM_{2.5}$ emissions from the operations addressed in Condition 2.4.

The BACT determination in the permit appropriately addresses the storage piles. Storage piles do not have the variability in operation, potential emissions and available control measures that are generally present with roadways. For example, the particulate emissions from paved roadways depend upon the amount of fine material or "silt" that is accumulated on the road surface, which originates from sources other than the roadways. Emissions are controlled by actions that are taken for a roadway to remove or consolidate the accumulated silt that commonly occur on periodic or intermittent basis. The particulate emissions of a storage pile directly depend on the silt contained in the material that is being handled in the storage pile. Emissions are generally controlled in a continuous manner by the properties of the stored material or by application of dust suppressants to the material while it is placed on the pile.[55] Because of these differences, it is appropriate that implementation of a fugitive dust control program be part of the BACT determination for roadways. However, this is not the case for the storage piles.

In response to this comment, Condition 2.4.5 in the issued permit does require control measures for the storage piles to be carried out in accordance with a written dust control program(s). This is a reasonable step to enhance the practical enforceability of the emission limits that have been set for storage piles.

75. The permit should restrict storage of coal and coke at the plant to that needed for the operation of the plant.

The permit does not allow the plant to operate as a fuel terminal. As such, storage of fuel at the plant is restricted to fuel that would actually would be used by the plant, as generally requested by this comment. This is because the total amount of fuel that may be used is restricted (See Condition 2.1.4(b).) In addition, the facility if broadly constrained to be consistent with the description in the application. It would be inconsistent with the application for the

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[55] In the case of the limestone storage piles at the proposed plant, the materials are associated with the crushing and screening operations that prepare raw limestone for the kilns. Two piles will contain material in appropriate size ranges for feed to the two kilns. The other piles will contain the undersize material and oversize materials.

The fuel piles contain material purchased from the fuel supplier under contract subject to specifications for the quality of the fuel.

facility to operate as a fuel terminal because this manner of operation was not described in the application.

76a. The project record for the proposed permit does not appear to address updates to the Endangered Species Analysis (originally included as Section 6.10 of the original application submitted in 2008).

An update to this analysis was not needed. Information on the presence of federally endangered species in different locations is available from the United States Fish and Wildlife Service Environmental Conservation Online System. There have not been changes to the listing of endangered species for Randolph County since the original analysis for endangered species was conducted.[56]

76b. The project record is silent on the evaluation of the project with respect to the National Historic Preservation Act. There is no record of consultations under these two programs per the original or the supplemental Project Summary.

The USEPA has completed consultation for the proposed plant under the National Historic Preservation Act.

FOR ADDITIONAL INFORMATION

Questions about the public comment period and permit decision should be directed to:

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[56] The original endangered species analysis for this facility, *Ecological Risk Assessment Screening Evaluation*, April 5, 2010, was prepared by URS. It addresses four endangered species, i.e., the small whorled pogonia (isotria medeoloides), the pallid sturgeon (scaphirhynchus albus), the least tern (sterna antillarum) and the Indiana bat (myotis sodalis).

LISTING OF SIGNIFICANT CHANGES
BETWEEN THE DRAFT PERMIT AND THE ISSUED PERMIT

Section 2.1: Unit-Specific Conditions for the Kilns

Condition 2.1.2 – In this condition, which lists the new emission units, the designation for the fabric filters or baghouses on the kilns, CD 6 and CD 7, are now provided. This change was made for clarity.

Condition 2.1.3-2(a)(ii) – This condition, which identifies BACT control technology for the NO_x emissions of the kilns, now requires that selective non-catalytic reduction (SNCR) technology also be used to control the NO_x emissions of the kilns. This change was made in response to comments that showed that SNCR technology is now an feasible control technology for control of NO_x emissions of preheater lime kilns.

Condition 2.1.3-2(c) (new) – As a result of the NO_x control technology that is now required for the kilns, i.e., SNCR, as addressed by Condition 2.1.3-2(a)(ii), this new condition sets an additional BACT limit for NO_x that reflects use of SNCR technology. This limit is initially 2.61 pounds of NO_x per ton of lime on a 12 month running average, effective beginning after completion of a 12-month shake-down period. This limit reflects the NO_x emission rate that should clearly achievable with SNCR technology. This limit is based on the available information about the NO_x emission rate that is achieved on lime kilns with this technology, which has only been used on a handful of lime kilns. The key guidepost for this determination is USEPA's determination of Best Available Retrofit Technology (BART) for the Kiln 1 at Lhoist's lime plant in Nelson, Arizona. Because SNCR technology is not a well-established technology for lime kilns, a shakedown period of 12 months is provided, with the initial determination of compliance with the limit to be determined 24 months after a kiln initially starts operation. This condition also provides for a lower limit to be established based on the demonstrated performance of these kilns with this technology. This provision was included because the use of SNCR is a relatively new development and there is a distinct possibility that this technology may enable a significantly lower emission rate to be achieved by these kilns. In this regard, based on reported NO_x emissions data, the NO_x emission of lime kilns using Lhoist's proprietary SNCR technology are significantly lower than 2.61 pounds per ton of lime on an annual average basis.

Conditions 2.1.3-2(d)(i) (B) (renumbered*) – This condition has been revised to address comments concerning the approach to the evaluation of the GHG emission rate of the kilns based on their demonstrated performance and the possible downward adjustment of the BACT limit for GHG emissions of these kilns. The revised condition requires this evaluation to be conducted by Mississippi Lime. The draft permit would not have required this evaluation if Mississippi Lime finds, based on the actual performance of the kilns, that the kilns can comply with a lower BACT limit for GHG that reflects 10 percent better energy efficiency. The change addresses the observation expressed in a comment that the limited data for GHG emissions, which is the reason for this provision, also means that there is limited data upon which to set a predetermined lower limit for GHG emissions that would serve as an alternative to the otherwise required evaluation.

* Draft Condition 2.1.3-2(b)(iii)(A) has been renumbered as Condition 2.1.3-2(d)(i)(A).

Condition 2.1.3-2(d)(ii) (new) – This new condition provides that emission of GHGs from the kilns are to be determined using relevant methodology from USEPA's rules for Mandatory Greenhous Gas Reporting, 40 CFR Part 98 Subpart S. In addition, as testing for emissions of methane and nitrous oxide is required for the kilns, this condition also appropriately provides that emissions of these pollutants shall be based on test results if testing shows emission rates higher than the rates specified in 40 CFR Part 98 Subpart S. This condition responds to a comment that expressed concern that the draft permit did not specify the methodology for calculating GHG emissions for these kilns.

Condition 2.1.6(a)(ii) (new*) – This condition establishes lower limits for the annual NO_x emissions of the kilns that reflects the use of SNCR technology and the additional BACT limit for the kilns set in Condition 2.1.3-2(c).

* In the issued permit, draft Condition 2.1.6(a) has been renumbered as Condition 2.1.6(a)(i).

Note to Condition 2.1.6 (new) – This new note explains that if a lower BACT limit for NO_x or GHG is established for the kilns in a revised permit pursuant to the required evaluations of emissions based on demonstrated performance of the kilns, the annual limits for NO_x and/or GHG emissions of the kilns in Condition 2.1.6 would be similarly lowered.

Condition 2.1.7(a)(ii)(A) (renumbered*) – In response to comments concerning emission testing for the kilns, changes have been made to separate emission testing of the NSPS and NESHAP pollutant, i.e., particulate matter, which is now addressed by Condition 2.1.7(a)(i), from testing for pollutants other than particulate matter, which is now addressed in Condition 2.1.7(a)(ii).

* Condition 2.1.7(a)(i)(B) from the draft permit has been renumbered as Condition 2.1.7(a)(ii)(A). As a result of this change, Condition 2.1.7(a)(ii) from the draft permit has been renumbered as Condition 2.1.7(a)(i)(B).

Condition 2.1.7(a)(i)(C)(new) – This condition requires testing for emissions of condensable particulate emission be conducted in conjunction with the testing for emission of particulate matter required by the NSPS and NESHAP. As a result, these tests for particulate would provide the emission data needed to verify compliance with the various limits for particulate set for the kilns by his permit. This change corrects an oversight in the draft permit.

Condition 2.1.7(a)(ii)(B)(new) – In response to a comment concerning the requirement for periodic emission testing for pollutants other than particulate matter, this new Condition 2.1.7(a)(ii)(B) requires periodic testing of the kilns for pollutants other than particulate matter every five years following the initial emission testing.

Condition 2.1.7(a)(iii) – This condition is revised to remove requirements for CO testing in the event that continuous emission monitoring is not needed for CO. This change was made because continuous monitoring is no longer optional and is required in the issued permit.

Condition 2.8.1-1(a) – This condition is revised to clarify the periods when the continuous emission monitoring systems does not need to operate.

Draft Condition 2.8.1-1(c) (not retained *) – In response to a comment concerning the "extended outages" of the SO_2 CEMS and further consideration to comment, draft Condition 2.8.1-1(c) is not included in the issued permit.

* As result of this change, Conditions 2.1.8-1(d) and (e) of the draft permit has been renumbered as Conditions 2.1.8-1(c) and (d), respectively.

Condition 2.1.9(g)(iii) (new) – As a result of new Condition 2.1.3-2(d)(ii) addressing the calculation methods for GHG emissions, this new condition requires additional records related to GHG emissions from the kilns in accordance with 40 CFR 98 Subpart S.

Draft Condition 2.1.11(a)(ii) (not retained*) – In response to a comment concerning the approach to evaluation of the GHG emission rates for the kilns and possible downward adjustment of the BACT limit for the GHG emissions of the kilns, draft Condition 2.1.11(a)(ii) is not included in the issued permit.

* As a result of this change, draft Condition 2.1.11(a)(iii) has been renumbered as Condition 2.1.11(a)(ii). In addition, this Condition has been revised to address the change in method to set a lower limit for the GHG emissions from the kilns, i.e., based on actual operation of kiln.

Condition 2.1.11(b)(i) – In response to a comment concerning the evaluation for GHG emissions for the kilns be mandatory and not optional, Condition 2.1.11(b)(i) has been revised to requiring the evaluation for GHG emissions be mandatory.

Condition 2.1.11(b)(ii) (new*) – This new condition requires the Permittee to submit an annual progress report for the evaluation for the GHG emissions for the kilns following the first year.

* As result a of this change, Condition 2.1.11(b) (ii) has been renumbered as Condition 2.1.11(b)(iii).

Condition 2.1.11(b)(iv) (new) – This new condition requires the Permittee to submit the final report for evaluation for the GHG emissions, which would constitute a submittal of a revised permit application.

Condition 2.1.12 (new) – This new condition establishes requirements for addressing revision of the BACT Limit for NO_x Emissions based on actual performance of the SNCR Technology on the Kilns. The evaluation for NO_x emissions for the kilns would also be mandatory. This new condition also requires the submittal of an annual progress report for evaluation until final report is submitted. The final report for evaluation for the NO_x emissions also would constitute a submittal of a revised permit application.

Section 2.2: Unit-Specific Conditions for Handling of Limestone and Solid Fuel

Revised notes to Conditions 2.2.2 and 2.2.6(a) – The notes to Conditions 2.2.2 and 2.2.6(a) have been revised to correct a discrepancy from the draft permit. In particular, the limestone feeders (EP12 and EP13) for the kilns is an aspect of the operation of the kiln and not a discrete limestone handling operation. PM emissions of these feeders are addressed with the emissions of the kilns.

Conditions 2.2.3-2(a) and (b) – As a result of a reevaluation conducted in response to a comment concerning the BACT limit for PM emissions from the limestone and fuel handling units, the stack emission limit for these units are lowered to 0.004 gr/dscf. The change addresses the observation expressed in that comment that a lower BACT limits were established for the material handling at a Universal Cement or a Portland Cement Plant.

Conditions 2.2.3-4 (new*) – As a result of a reevaluation conducted in response to a comment concerning applicability of the NSPS for Coal Preparation Plants 40 CFR 60 Subpart Y, new Condition 2.2.3-4 has been added to the draft permit that addresses the federal emission standards for units handling coal.

* As a result of this change, draft Condition 2.2.3-4 has been renumbered as Condition 2.2.3-5.

Condition 2.2.4(a) (not retained*) – Draft Condition 2.2.4(a), which indicated that units at the plant handling coal were not subject to the provisions of the NSPS for Coal Preparation Plants, 40 CFR 60 Subpart Y, is not retained in the issued permit. As already discussed, the units handling coal at the plant are not exempt from the requirement of 40 CFR 60 Subpart Y.

* As a result of this change, draft Condition 2.2.4(b) has been renumbered as Condition 2.2.4(a).

Section 2.3: Unit-Specific Conditions for Lime Processing and Handling Equipment

Conditions 2.3.3-2(a) (iii), (b)(iii) and (c)(iii) – As a result of a reevaluation conducted in response to a comment concerning the BACT limit for PM emissions from the lime handling units, the stack emission limit for these units are lowered to 0.004 gr/dscf. The change addresses the observation expressed in that comment that a lower BACT limits were established for the material handling at a Universal Cement or a Portland Cement Plant.

Condition 2.3.3-3(a) – Cross-references in this condition to other permit conditions have been corrected.

Conditions 2.3.6(a) and (b) – As a result of a reevaluation in response to comments concerning the ratio of $PM_{2.5}$ to PM_{10} and higher than the set BACT limit for certain emission limits are corrected to match the lower of the permitted rate or the modeled rate.

Condition 2.3.7(b) – This condition is revised to include the observation methods for visible emissions and opacity for load out emission units.

Condition 2.3.7(b)(ii)(C) (new) – This new condition addresses observation of the visible emissions from the operation of other units that load truck or rail cars, or barge loading units.

Condition 2.3.7(c) (new) – In response to a comment concerning a practical means of a compliance demonstration, Condition 2.3.7(c) includes testing for two of the emission units upon startup. The issued permit would also include provision of testing of the units upon request by the Illinois EPA.

Condition 2.3.8(b) – In response to a comment concerning the frequency of inspections for the lime processing and handling equipment in the draft permit, Condition 2.3.8(b) includes requirements for periodic inspections.

Condition 2.3.9(d) (new) – As a result of a reevaluation of the recordkeeping requirements in response to a comment concerning the loadout of quicklime and off-specification lime, new Condition 2.3.9(d) of the issued permit requires the Permittee to keep records necessary to verify compliance with the emission limits for these loadout operations.

Section 2.4: Unit-Specific Conditions for Storage Piles and Roadways

Condition 2.4.2 – Condition 2.4.2 is revised to clearly identified the list of emission units and pollution control equipment.

Condition 2.4.3-3 (new) – This Condition addresses the federal emission standards for open storage pile(s) for coal pursuant to 40 CFR 60 Subpart Y that are applicable to open storage piles for coal.

Condition 2.4.5 – In response to a comment concerning identifying control measure technology for storage piles, Condition 2.4.5 has been revised to require control measures for the storage piles to be carried out in accordance with a written dust control program(s).

Condition 2.4.6 – As a result of a reevaluation of the annual emission rates of PM_{10} and $PM_{2.5}$ used in modeling in response to a comment concerning roadways and parking areas and limestone storage piles, Condition 2.4.6 has been revised to correct the identified inconsistency.

Attachment 1

The summary of the permitted annual emissions of the plant in this attachment has been revised to reflect the various changes to the emissions limits for emissions of NO_x, PM, PM_{10} and $PM_{2.5}$. In response to a comment concerning the emissions of the emergency engine generators during the operational testing that may occur during the kilns are in operations, Attachment 1 includes the annual emissions from the generators that address the emissions during the operational testing.