Illinois Environmental Protection Agency
Bureau of Air
December 2010

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

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DECISION

On December 30, 2010, 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 a off-site lcoation .

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 St. Louis Post Dispatch on October 4, 2010 and the Red Bud North County News on October 7, 2010. The notice was again published in Red Bud North County News on October 14 and 21, 2010. The public hearing was held on November 18, 2010 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 December 20, 2010.

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. From the Illinois EPA's website:

   http://www.epa.state.il.us/public-notices/general-notices.html

2 By viewing documents at one of the following repositories:

   Illinois EPA
   Collinsville Regional Office
   2009 Mall Street
   Collinsville, IL
   618/346-5120

   Illinois EPA
   1021 N. Grand Ave., East
   Springfield, IL 62794
   217/782-7027

3. By contacting the Illinois EPA by telephone, facsimile or electronic mail:

   Illinois EPA
   Bradley Frost, Office of Community Relations
   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. Would the proposed plant be different from Mississippi Lime's existing facility in Ste. Genevieve. If not, why does Mississippi Lime want to build another plant in Prairie du Rocher, so close to Ste. Genevieve?

   As explained by Mississippi Lime, the proposed plant would be similar to but much smaller than the existing facility in Ste. Genevieve. The existing facility is a very large lime manufacturing operation with many lime kilns. It has much more capacity than the plant that would be built in Prairie du Rocher, which would only have two lime kilns.

   As further explained by Mississippi Lime, it acquired the reserves of "good quality" limestone at the proposed plant site so it would be able to grow and diversify, as necessary for it to continue to survive in the competitive lime industry. It also is comfortable operating a plant in Prairie du Rocher working with the local community. There are logistical advantages to having a lime plant on the east side of the Mississippi to supply markets for lime that are to the north and east.

2. How tall will the stacks of the kilns be?

The stacks of the kilns would be 250 feet tall. This is over twice the height of the bluffs along the northwest boundary of the plant site. The stacks must be this tall to avoid downwash or interference with good dispersion from the bluffs.

3. Were stronger emissions controls considered for the kilns, especially for emissions of particulate matter.

   The emissions of particulate matter from the kilns must be controlled by add-on control systems. Fabric filters or baghouses are generally considered the most effective technology for control of particulate where this technology can be applied. Filtration technology can certainly be applied to lime kilns. The permit would require establish a stringent limit for the performance of the fabric filter, including limits that directly address emissions of fine particulate matter or $PM_{2.5}$.

4. Would scrubbers be used for control of the SO_2 emissions of the kilns?

   "Add-on" scrubbers systems would not be required to be used for control the SO_2 emissions of the 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 SO2 emissions, essentially acting like a dry scrubber system.

5. Was consideration given to use of natural gas as the fuel for the plant, rather than coal and petroleum coke?

   The use of natural gas was considered as a means to reduce emissions of the plant and was rejected. This is because if the negative effects it would have for emissions of nitrogen oxides (NOx), 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 NOx, because of how fuels burn in a lime kiln. In addition to nitrogen dioxide (NO_2) being an air pollutant, NOx is a precursor pollutant that contribute to formation of both ozone and fine particulate matter ($PM_{2.5}$) in the atmosphere. At the same, 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 emission from the ash in the solid fuel is 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.

6. When was the evaluation of natural gas completed? What cost was used for natural gas? Natural gas is pretty inexpensive now compared to the past.

This evaluation was completed shortly before the draft permit was released for public review. The evaluation assumed natural gas would cost $3 per million Btu more than solid fuel.

7. Some new electric power plants use a combination of baghouses and electrostatic precipitators. Why there was no requirement to use electrostatic precipitators as a final cleaning step for this plant.

Circumstances are present for some new coal-fired power plant that result in use of both a baghouse to control emissions of particulate matter and a wet electrostatic precipitator to control emissions of sulfuric acid mist.[1] These circumstances are not present for the proposed lime kilns. The natural scrubbing action of the limestone and lime dust would be effective in controlling emissions of SO_2, minimizing conversion of SO_2 to sulfuric acid mist.

8. How is the plan for a new plant, like the proposed plant, developed? Does the source select the proposed fuel and present its plans to the Illinois EPA for review? Or is it a dialogue where a source expresses interest in developing a plant and the Illinois EPA determines what would be acceptable and what fuels may be used?

An applicant for a proposed project develops its plans for the plant that is would like to build and presents them in an application to the Illinois for review. As part of the application, the applicant must include relevant information to show that the plant would be designed to comply with applicable emission standards and requirements. For a major project, the applicant must include an analysis of the various alternatives that might be used as Best Available Control Technology (BACT) for to minimize emissions. For example, as part of its application, Mississippi Lime evaluated the emissions, environmental and cost impacts that would accompany use of natural gas, rather coal and petroleum coke as planned.

9. I compared the draft permit for the proposed plant to a permit recently issued to Vulcan Materials for another new lime kiln in Manteno, about 45 miles south of Chicago. Why do the limits setting Best Available Control Technology (BACT) for PM emissions of this proposed plant appear to be twice those set for the Vulcan plant, while the BACT limits for other pollutants would be lower?

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[1] **The wet electrostatic precipitators on those coal-fired power plants are used to control emissions of sulfuric acid mist. These are formed when a wet scrubber is used for control of SO_2 emissions.**

If the proposed BACT limits for the this plant and the Vulcan plant are compared on the same basis, the BACT limits for this plant would be similar to or significantly lower than the limits that were set for the Vulcan plant. The difference between the limits is the form in which the limits are expressed. For Vulcan, the BACT limits are in terms of pounds per ton of limestone into the kiln. The BACT limits for this plant are proposed to be set in terms of pounds per ton of lime from the kiln. Since the lime output from a kiln is about half the limestone input, this means that the BACT limits for PM emissions of the two plants are actually identical. BACT limits for other pollutants would be lower. However, as the Vulcan plant would be smaller and process dolomitic limestone, rather than high-calcium limestone, the two limits for the two plants should not necessarily be directly compared.

10. The draft permit would provide that the case-by-case determination of Best Available Control Technology (BACT) for certain units would also be the case-by-case determination of Maximum Achievable Control Technology (MACT). Which emission units subject to these case-by-case MACT determinations?

    The emission units that would be subject to these case-by-case MACT determinations would be ones that are not be subject to standards for hazardous air pollutants adopted by USEPA at 40 CFR Part 63. These units would include operations such as handling of solid fuel and handling and processing of lime. A case-by-case determination of MACT would not be made for the kilns or the associated processed stone handling operations, as these units are subject to standards adopted by USEPA at 40 CFR 63, Subpart AAAAA.

11. Why does the permit not include a BACT determination for emissions of greenhouse gases? In less than two months, greenhouse gases will become a regulated pollutant under the federal PSD Program.

    The permit does not address greenhouse gases as a regulated pollutant because greenhouse gases are not yet a regulated pollutant under the PSD program. In addition, the kilns at this plant are being developed to use pre-heaters to reduce their fuel consumption. This is the control technology that would be required as BACT to reduce emissions of greenhouse gases from the plant.

12. I am concerned about the impact of the proposed plant on public health and the health of those living near the plant.

    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.

13. Did the modeling address the National Ambient Air Quality Standards (NAAQS) recently adopted by USEPA for NO_2 and SO_2 air quality on a one-hour average?

The application included dispersion modeling to address these new NAAQS standards.

14. It does not appear Mississippi Lime or the Illinois EPA has adequately studied potential impacts. Wind patterns are unique to the bottomland. Readings taken miles away and in areas not in a valley are invalid parameters to use in modeling. There is frequently no wind at all, for days at a time.

The five years of hour-by-hour meteorology used in the modeling would cover all meteorological conditions experienced in the region. This includes inversions as they are a regional phenomenon, not unique to either Prairie du Rocher or the St. Louis area. Using a meteorological data set that extends over five years and that was collected at a first order National Weather Service station in the same region as the proposed plant provides a very reliable source of data.

The dispersion modeling takes into account plume impacts on the bluffs. The modeling uses elevated terrain elevations to help simulate such occurrences. Other dispersion characteristics such as plume dissipation and other factors affecting turbulence or the lack of it are also accounted for in the model.

15. As this plant would be in the Mississippi River Valley, it is important that the Illinois EPA assure that the modeling has been done correctly. I live further north in the American Bottom, which is also in the Mississippi River Valley. It has temperature inversions. At times, especially in the summer, the air just seems to hang there, without moving, for several days.

The temperature inversions that are being described are not a "valley effect" and limited to the Mississippi Valley. From a meteorological perspective, the Mississippi River Valley in both the American Bottom and at Prairie du Rocher is both very wide and very shallow so that it does not interfere with the prevailing wind patterns. Rather the inversions described by this comment, i.e., period of low winds with limited mixing of the air, are one of the weather patterns that occur and are experienced at times throughout the region, not simply in the bottomland.

16. How would the proposed plant affect people who live very close to the plant. There is a home to the southwest of the plant that would only be about 400 yards away from the new kilns. That property includes land on the east side of Goose Lake Road that would be surrounded on three sides by Mississippi Lime and would only be about 300 yards from the new kilns?

The air quality modeling analyses for the plant addressed air quality impacts in all directions from the plant, including

impacts on this home. The modeling showed that the ambient air quality at this home would continue to comply with the NAAQS.[2] Because Bluff Road and Goose Lake Road are public thoroughfares, compliance with the NAAQS had to be shown along these roads. Compliance also had to be shown on the piece of private property that is to the east of Goose Lake Road.

17. Did the Illinois EPA review all the modeling that Mississippi Lime submitted or was the modeling simply accepted? I would like all the modeling to be verified by the Illinois EPA.

The modeling for the plant was fully audited by Illinois EPA to confirm proper procedures and compliance with USEPA Guidance. Model inputs such as emissions, stack parameters and building locations, were verified for consistency with the other technical information in the application. Modeling options and procedures were reviewed for assurance that these methodologies were in accordance with federal and state guidelines. Processed meteorological data, building downwash, and receptor heights were recreated and incorporated into the audit modeling runs performed by the Illinois EPA and the results were reviewed to verify that the conclusions of the submitted air quality analysis concurred with the results of the audit modeling.

18. The increase in diesel truck traffic to and from the plant, about 80 to 100 trucks a day, should be included in the air quality analysis.
The emissions from additional truck traffic in the area are accounted for in air quality analysis with the data for background air quality that is collected from ambient air quality monitoring stations.

18. Where is the closest ambient air monitor station to Prairie du Rocher?

Until recently, the air quality monitoring station closest to Prairie du Rocher was the $PM_{2.5}$ monitor in Missouri at the Ste. Genevieve High School, about 10 miles to the south of Prairie du Rocher. This monitor became inactive in May 2009. The historic data collected at the station showed compliance with the NAAQS for $PM_{2.5}$ with a significant margin.[3]

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[2] The impacts that are of particular interest for the proposed plant are the short-term air quality impacts, rather than annual average impacts. The modeling for the plant showed maximum hourly air quality impacts from the plant for NOx and SO_2 that are to the north and east of the plant on the land above the bluffs, within one kilometer of the plant. This is to be expected since the land above the bluffs is higher than the plant site so that the kiln stacks do not extend as far above that land as they do for the bottomland that is at the same elevation as the plant site.

The modeling for the plant showed maximum short-term impacts for particulate to the northeast of the plant next to Bluff Road. This is also to be expected as these impacts are due to both the kilns and ground level operations at the plant and the impacts occur in the area of Bluff Road that is closest to the plant.

[3] At the Ste. Genevieve Station, in 2008, the last complete year of monitoring, the annual average concentration for $PM_{2.5}$ was 11.7 micrograms per cubic meter ($\mu g/m^3$),

The air quality monitoring station closest to Prairie du Rocher is now in Houston, Illinois, about 20 miles east of Prairie du Rocher.[4] Monitoring is conducted at this station for ozone, SO_2 and $PM_{2.5}$. In 2009, compliance was shown with the applicable NAAQS for these pollutants.[5]

19. Is there any consideration to developing an ambient monitoring station in Prairie du Rocher? I know that Illinois' budget for ambient monitoring is tight.

The circumstances of the proposed plant do not support installation of an additional ambient monitoring station closer to Prairie du Rocher. The air quality modeling conducted for the proposed plant confirms that the limits that are set for its emissions plant would be protective of air quality. The emissions of key pollutants from the kilns would be directly monitored through emissions monitors on the stacks to verify compliance with the limits that have been established. Stack monitoring would also be used to confirm proper operation of the baghouses on the kilns.

Ambient monitors are commonly located in urban areas where there many sources or where modeling or the existence of a certain source suggests that air quality may be threatened. In those circumstances, the ambient monitoring provides additional data that is needed to protect air quality. It also provides date that can be used in conjunction with modeling to evaluate possible measures that would reduce emissions from existing sources and to track and verify the actual effectiveness of measures that are implemented.

20. What recourse is there if the emission limits are found to be too high? The draft permit would allow annual emissions of approximately 1,500 tons of nitrogen oxides, 300 tons of SO2, and 50 tons of $PM_{2.5}$. Based on my research, the proposed plant would essentially be equivalent to a small power plant.

The purpose of the air quality analysis that was performed for the plant is to confirm that the emissions of the plant would not cause air quality problems. Accordingly, there should not be a need to revisit the emission limits set by the permit unless tighter air quality standards are adopted. In that case, Mississippi Lime would have to take appropriate actions to as needed to ensure that those new air quality standards are met.

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compared to the NAAQS of 15 $\mu g/m^3$. The highest and second highest daily measurements were 27.2 and 23.6 $\mu g/m^3$, respectively, compared to a NAAQS of 35 $\mu g/m^3$.

[4] The other nearby monitoring stations are Swansea, Illinois (about 35 miles to the north) for $PM_{2.5}$, and East St. Louis (about 40 miles due north) for SO_2, NO/NO_2, PM_{10}, $PM_{2.5}$, CO, lead and ozone.

[5] In 2009 at the Houston Station, the annual average concentration for $PM_{2.5}$ was 9.7 $\mu g/m^3$, compared to the NAAQS of 15 $\mu g/m^3$. The 98th percentile value for daily samples was 21 $\mu g/m^3$ compared to the NAAQS of 35 $\mu g/m^3$.

21. The St. Louis Metropolitan area and Baldwin Township in Randolph County are already nonattainment for fine particulates, $PM_{2.5}$. If this part of Randolph County would become nonattainment for $PM_{2.5}$, it would have a negative impact on future economic development. Better emission controls would protect the people of Prairie du Rocher, the environment and the future development of the area.

It is not expected that the existing St. Louis $PM_{2.5}$ nonattainment area will expand. Rather, the nonattainment will "shrink" as emissions from existing sources that are contributing to nonattainment, both locally and regionally, are reduced, to bring the area into attainment. In this regard, the part of Randolph County that is designated nonattainment is not designated because of the air quality in that township but because it is the location of Dynegy's Baldwin power plant.[6, 7] These measures to improve air quality in the current urbanized nonattainment area will also act to improve air quality in less developed areas and in rural areas.

22. Some people have concerns about the potential impacts of emissions on their crops.

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

23. I am concerned about air pollution impacts on the area's flora and fauna, especially on the Fults Nature Preserve, the many hill prairies and marshland. It is not clear that there will be no impact to threatened and endangered species.

The impacts on threatened and endangered species were also evaluated to confirm no adverse air quality impacts.

24. The Project Summary prepared by the Illinois EPA to accompany the draft permit provides three different numbers for the proposed plant's potential emissions of particulates, a number for particulate matter, a number for PM_{10}, and a number for $PM_{2.5}$. What is the difference? Are the total potential emissions 250 tons, the sum of the three numbers?

Separate information was provided for the potential annual emissions of each form of particulate matter that is regulated. The potential annual emissions of particulate generally would be 107 tons. The emissions of PM_{10} would also be 107 tons. The emissions of $PM_{2.5}$ would be 53.2 tons. These values should not be added together.

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[6] **USEPA has designated a number of "clean air areas" in the vicinity of $PM_{2.5}$ nonattainment areas as also being in nonattainment as they are the locations of major coal-fired power plants. This results in those power plants being subject to the more stringent requirements under the Clean Air Act that may apply to existing sources in nonattainment area.**

[7] **There have been and will continue to be significant reductions in the emissions of the Dynegy's Baldwin plant.**

25. Would hourly limits be set for NOx and SO_2, rather than limits over a longer period? If not, I would like hourly limits.

The proposed short-term limits for NOx and SO_2 would apply on a three-hour average, which is appropriate for the plant.

26. How much lead would the plant be permitted to emit?

The permitted annual emissions would be 1.6 pounds.

27. How much mercury would the plant emit?

The application conservatively indicates potential mercury emissions of 11 pounds per year, assuming all mercury is emitted to the atmosphere.

28. The permit should require periodic emissions testing by an independent testing service.

Emission testing would be conducted by an independent testing service. As a construction permit, the permit focuses on the initial emission testing that would be conducted after construction of the plant is complete. The frequency of periodic testing is a matter that is generally addressed during the processing of operating permits for sources.

29. What impact do comments and concerns from the public have upon the Illinois EPA in it decision on this application?

The comments from the public that are most relevant to the permitting of this proposed plant are ones that relate to the applicable technical and regulatory issues that must be addressed in the review of the application for this plant. Comments supporting a proposed project because of the jobs and economic benefits that it would provide are generally are not relevant to this process.

30. What happens when a plant like the proposed plant in Illinois violates an applicable standard or permit limit for its emissions?

Even if the violation is corrected, the source must report the violation to the Illinois EPA. The Illinois EPA considers the nature of the violation, its cause, the corrective actions that were take, the environmental consequence of the violation, the frequency of similar violations, and other factors to decide upon the appropriate response that should be taken. Because all violations must be reported to the Illinois EPA, there are many minor violations, that if immediately corrected by the source, may only warrant more careful scrutiny of the source by the Illinois EPA in the future. Continuing violations are not overlooked or "grandfathered." If formal enforcement action is required, the Illinois Attorney General will represent the Illinois EPA.

31. The information submitted by Mississippi Lime to USEPA under the federal Toxics Release Inventory (TRI) Program for its facility in Ste. Genevieve shows variation in that facility's emissions from year to year. Is that something that is significant? Is it something that the USEPA or the Illinois EPA would follows up on?

The information reported under the TRI Program is available to USEPA, the Illinois EPA and others and can lead to follow up investigations. However, there are other, more important sources of information that directly address the compliance status of sources. First, a major source like the proposed source must submit a variety of periodic reports, including both routine compliance reports and deviations report that identify periods of noncompliance with explanation. Sources with emissions monitors must submit periodic monitoring reports that must not only report on the collected data but also report on the operation of the monitoring system, identifying periods of operation when the source was in operation by the monitoring system was unavailable. Second, major sources are periodically inspected by agency personnel. These inspections provide first hand observation of the operation of a source. These inspections also include review of the records kept by source and the resulting reports that are submitted. Additional inspections may be scheduled for a source to follow up on the conditions observed during a routine inspection. Special inspections may also occur to follow up on the reports that are submitted by a source. Unlike changes in data submitted under the TRI Program, which can result simply from the amount of business a source, these other activities directly address a source's operation and compliance status.[8]

32. Do plants get "pollution points" if their emissions pass regulations so often, as a form of incentive to keep emissions low?

Plants do not get "pollution points" as described in this question. Plants must comply with the various emission standards that apply to them or be subject to enforcement and potential fines. However, there are "emission trading programs" for certain large sources and in certain areas that apply in addition to or on top of the emission standards. The purpose of those programs is to generally manage or reduce emissions to achieve environmental goals for which overall reductions in emissions are needed in a region.[9] However, there are currently no such emission trading programs that would apply to the proposed plant.

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[8] The purpose of the TRI program was not to directly address compliance with applicable environmental standards. The purpose of the TRI Program, particularly as TRI data is available to the public, is to focus attention on releases of toxic and hazardous materials in wastewater, in solid waste, in emissions. As a result, it was believed that sources would voluntarily take measures to reduce those releases, by using other materials, reducing losses and waste, or better controlling discharges. The TRI program has been effective in achieving its objectives.

[9] For example, the federal Acid Rain Program relies on emission trading to reduce total SO_2 emissions from power plants as related to acid rain. Emission trading serves for this purpose because acid rain is the result by the cumulative effect of many large

33. Do the air pollution regulations include standards for emissions of radionuclide from lime manufacturing plants?

There are not standards for emissions of radionuclides from lime manufacturing plants, as it has not been found necessary to develop such standards. In this regard, lime manufacturing plants are different from nuclear power plants and other types of facilities for which there is a concern for release of and exposure to radioactivity and for which standards for emissions of radionuclides have been adopted.

34. My understanding is that Mississippi Lime has already received the National Pollutant Discharge Elimination System (NPDES) permit that addresses the wastewater discharges from the proposed plant. It is a shame that people did not know about the application for that permit so that they could comment on it. The Illinois EPA should to try to expand the ways that the public are notified of permits for proposed projects.

This understanding is correct, in part. An NPDES permit was issued for Mississippi Lime's facility in Prairie du Rocher on September 30, 2010, following the required 30-day comment period. However, this permit is a renewal of an NPDES permit that was first issued on September 16, 1993. That original permit addressed the discharge of both groundwater seepage from an underground mining operation <u>and</u> stormwater runoff from a limestone crushing and screening plant and a lime manufacturing plant.[10] In this regard, Mississippi Lime had an earlier plan to develop a lime plant in Prairie du Rocher. While than plan was put hold, Mississippi Lime maintained an NPDES permit that still provided for the wastewater discharges that would accompany operation of a lime plant.

The Illinois EPA would appreciate suggestions for improving its process for providing notice to the public of proposed actions on NPDES permits. However, in this case, given that an existing permit was being renewed, the significance of the fact that the permit addressed the possibility of a lime plant being operated at the site may not have been realized.

35. Would the ash from the plant be disposed of on-site?

The ash from the plant, i.e., the dust collected by the baghouses on the kilns, must be appropriately handled in accordance with applicable regulations. Mississippi Lime indicates that it hopes to sell this material. This material has value in agricultural applications and for soil stabilization as it is a low-quality mixture of lime and limestone. The permit does not provide for storage piles for either temporary storage of ash or permanent

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power plants, some of which may be located hundreds of miles from the areas where ecosystems are actually impacted by acid rain.

[10] Mississippi Lime indicates that its NPDES Permit, IL 00681444, has been continuously active since it was originally issued. Discharge monitoring reports are filed monthly and there have been no excursions of the effluent limits.

disposal of dust at the lime plant. Dust must be trucked from the lime manufacturing plant for sale, returned to the underground mine, where it would be kept for potential sale, or transported to another off-site facility.

36. The Illinois EPA does not appear to have considered a scrubber for control of SO_2 emissions from the lime kilns, despite requiring a scrubber as the basis for BACT in the recently issued permit for Vulcan Materials.[11] The fact that a dry scrubber (in addition to "natural" scrubbing) has been required in a different permit for a similar plant demonstrates that a scrubber is available, technologically feasible, and cost-effective. Absent specific findings (supported by data in the record) that there are site-specific reasons distinguishing the proposed kilns from the Vulcan kiln, BACT limits must be based on the use of dry scrubbers.

The Illinois EPA considered use of a dry scrubber for control of SO_2 emissions of the proposed kilns and promptly eliminated it as an alternative. This is because dry scrubbers would not provide meaningful, if any,[12] further reductions in emissions of SO_2, given the level of control that must be achieved with "natural scrubbing" at the proposed kilns. In this regard, the circumstances of the proposed plant and the Vulcan plant are different, as the proposed plant would process high-calcium limestone and Vulcan would process dolomitic limestone. Dolomitic limestone is a different mineral form of limestone than the high-calcium limestone that would be processed at the proposed plant. It is less effective at absorbing SO_2. Experience at the Vulcan plant showed that natural scrubbing would not be particularly effective at controlling the SO_2 emissions of its lime kiln. Accordingly, a dry scrubber was required on that kiln to "make up" for the limited removal of SO_2 that would be provided by natural scrubbing.[13] This difference in the circumstances of the two plants is evident when one considers the limits set for SO_2 emissions. The limit for SO_2 emissions of the proposed kilns with

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[11] In the project summary for the Vulcan permit, the Illinois EPA states "The Illinois EPA has determined that BACT for SO_2 emissions from the kiln as it processes Dolomitic limestone to be a spray dryer absorber." Natural scrubbing, as achieved simply with the lime kiln, is not adequate and must be supplemented with an add-on scrubber system. An appropriate SO_2 BACT emission limit with the scrubber is 2.20 lbs SO_2 per ton of stone feed to the kiln, 3- hour average, subject to downward adjustment (as low as 1.8 lbs/ton of stone feed) based on evaluation of the actual operation and SO_2 emissions of the kiln with planned improvement.

[12] **Natural scrubbing and dry scrubbing are actually very similar technologies. They both involve use of sorbent materials to collect SO2, which materials are then collected by a down-stream filter. In "natural scrubbing" on a lime kiln, the sorbent material, i.e., limestone and lime dust, are generated and introduced into flue gas as part of the normal operation of the kiln and preheater. In "dry scrubbing," the sorbent material is "artificially" introduced into the flue gas by an injection system.**

[13] **The use of a scrubber was found to be cost-effective for the Vulcan kiln considering the difference in SO_2 emission with only natural scrubbing and with natural scrubbing followed by dry scrubbing. Emission testing conducted on the Vulcan kiln, when it previously operated, measured SO2 emissions of more than 5 pounds per ton of limestone feed (equivalent to 10 tons of SO_2 per lime product). The reduction in SO_2 emissions assumed to achieved by the wet scrubber on the Vulcan kiln is several times more than the SO_2 emissions rates that are to be achieved at the proposed kilns with natural scrubbing.**

only natural scrubbing is significantly more stringent than the limit set for the Vulcan kiln with the combination of natural scrubbing and dry scrubbing.[14, 15]

37. A prior permit issued for the Vulcan lime plant (issued in 2002) required the use of a wet scrubber to meet a SO_2 BACT limit of 2.76 lbs per ton of stone feed. While that scrubber has not be constructed, the fact that the Illinois EPA found a wet scrubber to be available, technically feasible and cost-effective means that the Illinois EPA has an extremely high burden to find that it is not applicable to the proposed plant.

    This comment does not demonstrate that it would be appropriate to require a wet scrubber to be used on the proposed lime kilns.[16] **Again, the purpose of a wet scrubber on the Vulcan kiln would have been to make up for the limited removal of SO_2 provided by natural scrubbing as the kiln was processing dolomitic limestone. In addition, the limit for SO_2 set in that earlier permit was higher than the limit that is now set for use of a dry scrubber.**

38. Wet scrubbers have been applied to at least five cement kilns in the United States for control of SO_2 emissions and, therefore, wet scrubbing technology is available transfer technology for application to a lime kiln. Wet scrubbers also reduce emissions of hydrogen chloride and mercury and should therefore also be considered the basis for case-by-case MACT. Transfer technology is "available" technology for purposes of a BACT analysis. Therefore, even if a scrubber was not already required for Vulcan, it must be considered because it is a transfer technology from cement kilns.

    The use of a wet scrubber for control of the kiln's SO_2 emissions was appropriately rejected due to its associated environmental impacts. This comment does not demonstrate that wet scrubbers should be required on the proposed kilns. Most significantly, the use of a wet scrubber would be accompanied by an increase in the kiln's emissions of particulate matter. If equipped with a wet scrubber, the proposed kilns could not meet the NESHAP standard for filterable particulate, 0.10 pounds per ton of limestone feed.[17] **This limit can be met with natural scrubbing and a**

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[14] **The SO_2 BACT limit set for Vulcan on a short-term basis is 2.2 pounds per ton of stone feed, with provision that the limit be lowered to 1.8 pounds per ton based on the demonstrated performance of the kiln. The SO_2 BACT limit set for the proposed kilns is equivalent to 0.32 pounds per ton of stone feed.**

[15] **The circumstances of the two plants are also different in other respects, which also affect the emission rates that are achievable by the two plants. For example, the proposed plant would produce general purpose lime while Vulcan intends to produce lime for use in steel manufacturing.**

[16] **In the recent application, Vulcan proposed using a dry scrubber for a variety of reasons, including the particulate limit set by the NESHAP for Lime Manufacturing and the challenges that would be posed by wastewater from the scrubber. The use of a dry scrubber to comply with more stringent limits for SO_2 was found to be acceptable.**

[17] **As discussed in the response to comments on the draft permit for the Vulcan lime kiln, the NESHAP standard of 0.10 pounds per ton is equivalent to a particulate matter concentration of about 0.015 gr/dscf in the exhaust from a kiln. With a typical inlet particulate concentration to the control device of 10 grains/acf, a particulate limit of 0.10 lb/ton would require a wet scrubber on a kiln to achieve a nominal particulate**

baghouse, where re-entrainment of the scrubbant is not an issue.[18] Given the need to comply with the NESHAP and the fact that USEPA addressed emissions of mercury and hydrogen chloride when adopting the NESHAP, any possible benefits from a wet scrubber for emissions of other pollutants

39. The Illinois EPA has apparently not considered the actual SO2 emission rates measured at existing kilns. The Project Summary, which is the only formal explanation provided for the draft permit, merely indicates that an appropriate SO_2 BACT emission limit is 0.645 lbs SO_2 per ton of lime produced, daily average. There is no explanation for how Illinois EPA arrives at 0.645 lb/ton based on the pollution controls accepted by Illinois EPA as BACT.

The Illinois EPA is certainly aware that the SO_2 emissions of some lime kilns when tested are lower or much lower than the SO2 limit set as BACT for the proposed kilns. (For example, refer to the "Reed Memorandum.) However, this emission data, by itself, is of minimal value for determining BACT in the absence of relevant background information for the tested lime kilns, including data for things such as quality of limestone being processed, kiln type, capacity and size, type(s) of lime being manufactured, nature of the control train, operating rate during testing, fuel consumption and sulfur content. This data would be needed to be able to interpret the results of the test and determine whether they are applicable to the kiln that is being proposed. The need for this data to apply test results across facilities is discussed by USEPA in AP-42.[19]

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control efficiency of more than 99.85 percent. This removal efficiency is not achievable on a lime kiln with current wet scrubber technology. Even slight re-entrainment of the scrubbing liquid, with its suspended and dissolved solids, can result in emissions above 0.015 gr/dscf.

[18] The particulate limits that are achievable by lime kilns with wet scrubbers are confirmed by USEPA'a action when adopting the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Lime Manufacturing Plants, 40 CFR 63, Subpart AAAAA. This NESHAP limits the particulate matter emissions of new lime kilns (i.e., kilns constructed after December 20, 2002) to 0.10 pounds per ton of stone feed. By contrast, the limit for existing kilns equipped with wet scrubbers is 0.6 pounds per ton, six times higher. (*See* 40 CFR 63.7082 and 40 CFR 63.7090 and Table 1). As explained by USEPA in its Response to Public Comments for the Adoption of this NESHAP, this action was taken to accommodate continued use of wet scrubbers on existing lime kilns on which they were installed. This action responded to comments from a number of lime companies that the limit that was otherwise proposed for existing kilns, 0.12 lb/ton, was not achievable with the existing wet scrubber technology used for control of particulate. Those scrubbers would have to be replaced by baghouses, with excessive economic impacts and inappropriate environmental impacts, if USEPA did not set a separate, higher particulate limit for existing kilns controlled by wet scrubbers. (Refer to Section 3.1 of "National Emission Standards for Hazardous Air Pollutants (NESHAP for Lime Manufacturing Background Information Document – Volume II: Public Comments And Responses," USEPA, OAQPS, August 2003.)

[19] In AP-42 for lime kilns, USEPA notes that "For lime Because of differences in the sulfur content of the raw material and fuel and in process operations, a mass balance on sulfur may yield a more representative emission factor for a specific facility than the SO2 emission factors presented in Tables 11.17-5 and 11.17-6.

Accordingly, the SO_2 BACT limit was determined based on the level of SO_2 control that would be required to be achieved with the proposed SO_2 control technology, i.e., natural scrubbing. The level of control was calculated from the sulfur content of the design fuel and the design fuel consumption rate, as was explained in the Project Summary.[20] This level was found to be comparable to level of control that is considered to be achievable by a modern dry scrubber.

40. In comments to the Wisconsin DNR in July, 1996, USEPA Region 5 noted that Western Lime Kiln #2 in Green Bay had actual emission rates far lower than its permitted limits. The tested SO_2 rate, 0.1 lbs/hour for this 375 ton per day (15 ton/hour) rotary kiln, was 600 times lower than the permitted limit. In a 2002 test, the measured SO_2 emission rate was 1.26 lbs/hour at 40.0 tons/hour stone feed. In 2006, the SO_2 emission rate was 1.2 lbs/hour at 33.3 tons/hour stone feed. These rates are equivalent to 0.06 and 0.08 lbs of SO_2 per ton of lime. This rate is a factor lower than the proposed BACT limit in the draft permit. Moreover, the design of the proposed kilns would be more efficient, and therefore lower emitting, than the older kiln at Green Bay. The Illinois EPA has not explained why SO_2 BACT emission rates like these measured at this kiln were rejected as BACT for SO_2.

As already explained, emission test data for lime kilns, such as that provided in this comment, is of little use in establishing BACT limit unless accompanied by other supporting information. This comment did not include the needed supporting information, which is commonly the case with this type of emission data.

41. The SO_2 BACT limit for Kiln 2 at Western Lime in Green Bay is 9.0 lbs/hour, which based on its capacity, is equivalent to 0.60 lbs/ton of lime produced. See Permit 07-JGB-245 (Sept. 11, 2008). This limit is slightly lower than the one proposed for the more efficient (and therefore lower emitting) kilns at issue here.

The difference in the BACT limits for the kiln cited in this comment and the proposed kilns is not significant. At a minimum, this is because of the difference in the form of the limits. When the Western Lime kiln operates at a rate of 14 tons or less per hour, its BACT limit becomes equivalent to an emission rate of 0.645 lbs or more per ton.

42. As Illinois EPA is aware, many lime kilns have achieved emission rates much lower than the limits being proposed in the draft permit here. A November 14, 2000, memorandum from John Reed, Illinois EPA, to Robert Smet, Illinois EPA, in the Illinois EPA's files dealing with Vulcan Material's lime kiln in Manteno, lists numerous stack tests from the documentation for AP-42 (i.e.,

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[20] As explained on page 8 of the Project Summary, "An appropriate SO2 BACT emission limit with the scrubber is 0.645 lbs SO2 per ton of lime produced, on a daily or 24-hour average basis. This represents a nominal control efficiency of over 97 percent based on the design fuel supply for the kilns, considering only the SO2 emissions attributable to sulfur introduced with fuel and disregarding any sulfur retained in the lime product."

background USEPA relied upon to develop the emission factors in AP-42). The listing includes results from tests in which the measured SO_2 emission rates were equivalent to 0.026 and 0.30 lbs per ton of limestone, (assuming 1 ton of lime per 2 tons of limestone). Both of these rates are lower than the limit in the draft permit for the proposed kilns, 0.645 lbs per ton.

This comment, which addresses a predecisional memorandum prepared by a staff member of the Illinois EPA in 2000, does not provide a basis to set a lower SO_2 BACT limit for the kilns that are now proposed by Mississippi Lime. As noted in the comment, the cited document is a historic document. It was associated with the previous issuance of a revised construction permit for Vulcan's Manteno lime plant in October 2002. With respect to SO_2, the memorandum was prepared in response to Vulcan's initial proposal in 2000 for a revised SO_2 BACT limit for the kiln, i.e., 31.4 lbs/ton of stone feed. The memorandum does not recommend that a particular limit be set for SO_2 BACT, only arguing that the SO_2 limit then proposed by Vulcan should not be accepted as BACT.[21] It was not.[22] At the same time, this memorandum lists test results from lime plants whose specific circumstances, e.g., type of limestone feed and lime product, are not fully known. As such, the listed test results could not be correlated to the SO_2 emissions of Vulcan's lime kiln. Likewise, they cannot now be used as a basis to set an SO_2 BACT limit for the proposed kilns.

43. The Project Summary vaguely discusses SCR with flue gas reheat (following the particulate matter control) as a technology for control of NOx emissions. However, it is unclear why the Illinois EPA rejected the use of an SCR with flue gas reheat. The Illinois EPA needs to specify the basis for its decision. Notably, the application notes that reheat would be necessary, but then abruptly concludes that SCR is not technically feasible. There is not discussion about why reheat – a generally accepted practice for pollution controls – makes that control not feasible.

The Illinois EPA reasons for rejecting reheat SCR are clearly stated in the Project Summary. "Reheat of the flue gas to the operating temperature for SCR technology would be experimental, as reheat has not been applied to kilns. It would also be accompanied by increased emissions as additional fuel would have to be burned in the stack to reheat the flue gas. Use of an indirect reheat system would not be feasible because the dust loading in the hot flue gas would interfere with effective operation of the hot-side of the heat exchanger." Project Summary page 7.

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[21] For SO_2, the cited memorandum lists the results of 11 separate emission tests at five lime plants. All emission tests show emission rates that are lower than 31.4 lbs/ton, the limit then proposed by Vulcan. The highest rate listed is 12 lbs/ton.

[22] The revised permit for this lime plant issued on October 2002 set SO_2 BACT at 2.76 pounds per ton of stone feed, 3-hour average. In the current draft permit, this limit was proposed to be lowered to 2.2 pounds per ton to account for the reduction in fuel usage that will accompany installation of a pre-heater on the kiln. As already discussed, the issued permit also includes a lower BACT limit for SO_2, 2.0 lb/hr, that applies on a 30-day rolling average.

44. Fifteen cement kilns in the United States have Selective Non-Catalytic Reduction (SNCR) technology. This technology has been recognized as applicable to lime kilns also. In a BACT analysis submitted as part of the Vulcan Materials application in 2008, Vulcan recognized that SNCR has been applied to rotary lime kilns.

This comment does not demonstrate that SNCR technology is technically feasible for lime kilns. This is because there are significant differences between lime kilns and cements kilns that make SNCR feasible for cement kilns. New or upgraded cement kilns with precalciner and preheater towers have a suitable location in the ductwork where the temperature is in the correct range for SNCR technology. No such location is present with lime kilns, i.e., the temperature of the flue gas between the kiln and the preheater is less than the necessary temperature for SNCR to function.

In fact, Vulcan's 2008 BACT analysis states "The Use of SNCR Technology at Manteno is not technically feasible." (p.19 of the submittal). The commenter's confusion may arise from the analysis' discussion of the installation of SNCR systems on three different cement kilns, presumably to further explain the differences in the design and operation of cement kilns and lime kilns, which can make SNCR feasible for cement kilns but not lime kilns.

45. A properly designed SCR can avoid problems associated with high dust. For example, cement kilns at Solnhofer, Germany, and Cementeria di Monselice, Padova Province, Italy, have been operating high dust SCRs. See e.g., Dr. Al Armendariz, The Costs and Benefits of Selective Catalytic Reduction on Cement Kilns for Multi-Pollutant Control, (Feb. 11, 2008).

The installations of SCR systems on cement kilns in Europe address high dust applications of SCR as high dust is present in the flue gas of a cement kiln. They do not demonstrate the feasibility of SCR in the high dust conditions in a cement kiln. There are significant differences in the processes that occur in cement and lime kilns. This means that SCR technology is not transferable from cement kilns to lime kilns. In particular, the feed to a cement kiln is a fine powder, that is prepared by milling. The feed to a lime kiln is pieces of limestone that may be up to 1 or 2 inches in diameter, that are prepared by crushing and screening "run of mine rock." In a cement kiln the feed fuses together at very high temperature to form cement clinker. In a lime kiln, the objective is to completely convert the limestone rock into a lime rock of essentially the same size. This has implications for the heat transfer in the two kilns. As related to use of SCR technology, this has implications for the amount and size of the dust that is carried over into the flue gas, which must then pass through the catalyst beds in an SCR system without being deposited in and fouling the SCR.

46. Recent BACT determinations for cement kilns have determined Selective Noncatalytic Reduction (SNCR) technology to be BACT for NOx. The analyses leading to those determinations should be equally applicable to lime kilns.

Again, while both cement and lime are manufactured in kilns, there are differences in the processes that affect the feasibility of SNCR technology. SNCR is applicable to a modern cement kiln equipped with a preheater/precalciner tower because the transition between the rotary kiln and the preheater tower provides a suitable location for SNCR. No such location is present on a cement kiln.

47. There is no dispute that SCR with flue gas reheat (i.e., tail end SCR) is technically feasible. It has been applied to kilns, specifically cement kilns.3 In fact, LaFarge is installing an SCR on its cement kiln in Joppa, Illinois. There is no basis in the record for why this technology cannot be transferred to a lime kiln. Even if Illinois EPA made such a determination, it must provide the specific assessment, data, and calculations it relied upon. (A mere assertion is insufficient).

This comment reflects a flawed understanding of SCR technology as installed on cement kilns. These systems are installed "in-line" in the cement production process, not in reheat configurations. The challenge is preventing buildup of dust to maintain the effectiveness of the SCR catalyst. In this respect, cement kilns are more amenable to the use of SCR given the difference in the amount of dust that is entrained in the flue gas and its size.

Incidentally, this planned action by LaFarge is not a result of a BACT determination made in a PSD permit.[23] Rather it is an action that has been agreed to by LaFarge as part of the settlement of a national enforcement action. As explained by a representative of LaFarge, LaFarge has decided that is worthwhile to undertake the expense of a demonstration project for an SCR system in the interest of settling the enforcement case.

48. The Illinois EPA's analysis of SCR must also account for the fact that SCRs remove not only 90+ percent of NOx, but also about 80 percent of carbon monoxide and 70 percent of VOCs. Any cost effectiveness analysis of an SCR must account for these multi-pollutant benefits from the SCR. Additionally, if located prior to wet scrubbing, the SCR can oxidize mercury making it more soluble and more amenable to removal through wet scrubbing. Furthermore, the removal of VOCs with an SCR necessarily include removal of volatile HAPs. SCR also can achieve greater than 99 percent destruction of dioxins and furans. Because of these benefits for HAP removal, use of an SCR must also be considered as part of the case-by-case MACT analysis.

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[23] **The Illinois EPA is not aware any determinations made for lime kilns under the PSD rules that SCR constitutes BACT technology for control of NOx emissions. While one commenter suggested that this was the case, the claim was not supported.**

Consideration of any possible benefits for control of emissions of CO and VOM with SCR technology would not alter the determination that SCR cannot be required for the proposed plant because SCR is not feasible. In addition, given the absence of any experience with SCR is uncertain that SCR would provide the benefits for CO or HAPs that some research suggest are available for certain applications of SCR technology.

49. The Illinois EPA's analysis apparently lacks any investigation into actual emission rates at other kilns. The Western Lime kiln in Green Bay, which should have higher emission rates that the kilns proposed here because it is not designed with the higher efficiency planned for these, has emissions data showing NOx emissions below 2.94 pounds per ton of lime. See Wisconsin DNR Preliminary Stack Test Review, March 21, 2006. That lower NOx emission rate occurred while the CO emissions were also at approximately 1.75 pounds per ton of lime. In other words, the kiln achieved a much lower emission rate for both NOx and CO than the draft permit here would require as BACT. This has been achieved over time, as evidenced by the April 25, 2002, March 10, 2004, and November 28, 2007 results. See Review of Stack Test Results for Western Lime Co., (May 31, 2002); Preliminary Stack Test Review (May 20, 2004); Preliminary Stack Test Review, Western Lime Corp (Jan. 2, 2008).

This comment provides support for the NOx BACT limit set for the proposed kilns. Considering that BACT limits must be achievable, which necessitates a set with a margin of safety to account for normal variation in the effectiveness of control measures, it is reasonable that is 20 percent higher than emission rates measured during testing of the cited kiln.[24] Moreover, as the proposed kilns would have continuous emissions monitoring systems for NOx, rather than periodic emission test for NOx, one could argue that measured emissions of the cited kiln support a limit that is higher than the limit that has been set.

50. The Wisconsin DNR determined a regenerative thermal oxidizer was technically feasible for a lime kiln in Superior, Wisconsin, according to the Wisconsin DNR's Preliminary Determination. This technology has been applied to cement kilns with similar practices to rotary lime kilns. Illinois EPA apparently has not considered this technology for the proposed kilns, but must do so. USEPA Region 5 commented on Wisconsin DNR's analysis that this technology would reduce VOCs and condensable PM in addition to CO, so its cost must be spread between all affected pollutants.

While Wisconsin DNR may have stated that a regenerative thermal oxidizer is a "technically feasible" control technology for CO emissions from a lime kiln, that statement does not demonstrate

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[24] **The NOx BACT limit set for the proposed kilns is almost exactly 20 percent higher than the emission rate cited in this comment. ((3.5 – 2.94) ÷ 2.94 = 0.19, ≈ 20 percent)**

this technology is actually feasible. It certainly does not demonstrate that this technology should actually be used as BACT for a lime kiln. Indeed, this comment does not indicate that a lime kiln in Wisconsin was actually required to use a regenerative thermal oxidizer as BACT.[25] The fact that oxidizer technology may have been successfully used on cement kilns is also not relevant given the differences between cement kilns and lime kilns.

Accordingly, regenerative thermal oxidizer technology may certainly be considered an "available" control technology for control of CO emissions, as it was in the BACT demonstration in the application for the proposed plant. It is also reasonable that this technology was then rejected as infeasible as this technology has not been applied in practice. Moreover, the actual effectiveness of this technology in reducing CO emissions is uncertain given the concentration of CO in the exhaust of a lime kiln. The practicality of this technology is uncertain given the dust loading in the flue gas of a lime kiln, which would accumulate in the device interfering with the reliable operation of the heat exchanger. Finally, separate from technical feasibility, the device would use additional fuel, with accompanying negative environmental impacts, i.e., increases in emissions of NOx and greenhouse gases, especially if installed after a baghouse.

51. Regenerative thermal oxidizer systems are regularly required to control VOM emissions from feed dryers at corn-based fuel ethanol plants. The cost of control for those devices, and their energy and emissions impacts (nominal increases in some pollutants due to natural gas combustion in the RTO) should not be significantly different than if RTO technology was applied to the lime kilns. Moreover, at least one cement kiln uses RTO technology to control total hydrocarbons (THC) and CO. The technology results in 98 percent control of both THC and CO.

The fact that afterburners, including regenerative thermal oxidizer systems, are used on feed dryers at ethanol plants does not show that they would be a viable control technology for the proposed plant. The nature of lime kilns and feed dryers are very different. Feed dryers dry a biological material that contains residual ethanol that is not removed in the beer still. They operate at relatively low temperature so that the feed does not burn.[26] The emissions due to volatilization of ethanol and other organic compounds in the wet feed in the dryer and from degradation of the feed are significant and cannot be effectively addressed by process design. In this regard, the concentration of hydrocarbons in the exhaust of the dryers is such that they can contribute substantially to the fuel heat input to a thermal

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[25] Available information for the Graymont lime plant in Superior, Wisconsin (formerly Cutler-Magner) does not show that any of the plant's kilns are equipped with regenerative thermal oxidizer systems.

[26] Feed dryers may either be direct-fired, commonly with natural gas-fired burners or indirectly heated with steam.

oxidizer. In contrast, lime kilns process mineral material and operate at much higher temperatures.

52. The limits for particulate matter in the draft permit would be much higher than the BACT limit, 4.80 lbs/hour, set for a lime kiln in Wisconsin operated by Graymont (formerly CLM) in a determination of BACT from June 1, 1994. That BACT limit is equivalent to a rate of 0.23 lbs per ton lime, based on that kiln's rated capacity, 500 tons of lime per day.

    In fact, the BACT limit cited in this comment supports the BACT limits set for the proposed plant. When expressed in comparable terms, considering the difference in capacity of the kiln in Wisconsin and the proposed kilns, the BACT limits for particulate matter set for the proposed kilns are more stringent.[27]

53. Particulate matter emission testing of the Graymont kiln conducted in January 2006 showed total particulate emissions (both filterable and condensable) of 1.7 lbs/hour, while operating at a rate of 33.3 tons of stone feed per hour. This rate is lower than 0.11 lbs of total PM per ton of lime produced, which is significantly lower than the proposed BACT for this facility.

    The testing cited in the comment supports the BACT limit set for the proposed plan. The emission rate measured in that testing was 0.10 pounds per ton lime product. Considering the need for a "margin of safety" to account for normal variation in particulate emissions for a control system is properly operated and maintained, the emission rate measured at the Graymont kiln supports the BACT limits set for particulate emissions of the proposed kilns.[28] [29]

54. The permit provides startup and shutdown will be done with either gas or distillate fuel oil. These fuels are lower emitting than coal, but are not equal. Natural gas has a much lower emission profile than fuel oil. Illinois EPA has not done any analysis for BACT during startup and shutdown. I presume that any such analysis would rank natural gas higher than distillate oil. Additionally, because gas is less expensive than oil, it is unlikely that any BACT analysis would conclude that BACT should be based on oil instead of gas. For a lime kiln in Superior, Wisconsin, Wisconsin DNR required use of natural gas as BACT for periods of startup.

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[27] **The BACT limits for the proposed kilns for particulate matter are 0.18 and 0.14 pounds per ton of lime for filterable particulate matter and total PM10, respectively.**

[28] **For an emission unit controlled by a fabric filter it is certainly reasonable that considerations of a safety factor lead to an emission limit that is twice the emission rate measured in any particular test that is representative of proper operation of such unit and associated filter.**

[29] **In addition to the usual consideration for the "safety factor" that should be reflected in these limits, another factor is that a limit is being set for total particulate, including both filterable and condensable particulate. This raises uncertainty as to the test method used to measure condensable particulate in that test as compared to revised test method for measurement of condensable particulate recently adopted by USEPA.**

The permit appropriately addresses startup and shutdown of the kilns with the requirement to use either diesel fuel or natural gas as an alternative low-sulfur fuels (See Conditions 2.1.3-2(c)(ii) and (c)(iii)).[30] The fact that this comment overlooks is that the plant site currently does not natural gas service nor is it expected to have natural gas service.[31] The permit only provides for the use of natural gas in the event that it would become available. In that case, as observed by the comment, it should be expected that the kilns would use natural gas during startup and shutdown because natural gas is less expensive than distillate fuel oil.

The cost of constructing a pipeline to serve the plants, estimated at $ 1.75 million cannot be considered cost-effective as secondary fuels need only be used during periods of startup and shutdown, when natural scrubbing is absent, and distillate oil, as compared to solid fuel is a low sulfur fuel. The fact that a lime kiln in Superior, Wisconsin uses natural gas during startup does not provide any relevant information on these circumstances. That kiln is being "required" to use a fuel that is less expensive than the distillate oil that the proposed plant would be forced to use out of necessity because it does not have natural gas service.

55. A kiln operated by Western Lime in Schoolcraft County, Michigan has a BACT limit of 0.83 lbs SO_2 per ton of stone feed. Based on a standard yield rate of 2 tons of stone feed per 1.0 ton of lime product, that limit is significantly more stringent than BACT limit for SO_2 that would be set in the draft permit.

In fact, the SO_2 BACT limit cited in this comment supports the BACT limit set for the proposed plant. While the comment uses an appropriate factor for the ratio of limestone to lime at a lime kiln, when properly calculated, the equivalent SO_2 emission rate of the kiln in Michigan is 1.66 pounds per ton of lime.[32] This is significantly more than the BACT limit set for the proposed kilns, 0.645 pounds per ton of lime.

56. How was the sulfur content of the design fuel for the kilns, 3.5 percent by weight, established by Mississippi Lime? The sulfur content of coal can range from less than 0.5 percent sulfur to

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[30] During startup and shutdown of a kiln, the refractory lining of the kiln must be gradually heated or cooled, respectively, to minimize thermal stresses on the refractory. This is accomplished using an auxiliary fuel for several reasons. At the beginning of a startup and at the end of shutdown, the kiln may be too cold to properly fire solid fuel. The firing rate of the secondary fuel may be more readily managed at low firing rates than solid fuel. From an emissions perspective, during startup and shutdown of the kiln, while secondary fuels are being fired, limestone is also not fed into the kiln, so that natural scrubbing would not be present for control of SO_2 emission if solid fuel were fired.

[31] As explained on page 18 of the Application Submittal, dated June 11, 2010, the cost of tapping into the nearest suitable gas line and installing the piping and other equipment necessary to supply natural gas to the plant, with sufficient capacity for the startup and shutdown of a kiln, is $ 1.75 million.

[32] To convert from an emission rate expressed per ton limestone to a rate expressed per ton of limestone, one should multiply by two. One divides by two to convert from an emission rate expressed per ton of lime to one expressed per ton of limestone.

over 5 percent sulfur. The sulfur content of petroleum coke can be very high, with more than 8 percent sulfur.

The sulfur content of the design fuel is highest sulfur content of fuel at which the lime from the kilns would meet customer specifications for product lime. Coal and petroleum coke would be blended to stay within this level.

57. According to EIA data, low sulfur western coal is generally cheaper than higher sulfur coal from Illinois or central Appalachia. The application uses a cost $1.44/mmBtu for high sulfur coal and $1.55/mmBtu for low sulfur coal. However, Illinois Basin and Appalachian high sulfur coal is typically over $2.00/mmBtu.

If low sulfur western coal were actually less expensive for Mississippi Lime, it would of course choose to purchase western coal rather more expensive local coal. However, EIA data reflects average costs of coal. It does not reflect the actual cost for the proposed plant to use coal as it would use a relatively small amount of coal and coal could not be delivered directly to the plant by unit train. Coal would have to be stockpiled at an existing rail terminal and transferred for final delivery to the plant by truck. Because of these factors involved in the transportation of the coal, it may be questionable whether Western coal is truly available. However, local coal that can be delivered from a mine directly to the plant is clearly the least expensive.

58. Western low sulfur coal typically has a sulfur content around 0.5 to 0.6 percent, which is 83 percent less than the sulfur content of the design fuel for the proposed plant. Applying a control effectiveness of 97 percent for “natural scrubbing” (which is the effectiveness underlying the SO_2 emission rate set for the design fuel), the plant’s potential SO_2 emissions would only be about 50 tons per year, rather than 280 tons per year. This would be a significant reduction, so that potential use of Western low sulfur coal must be given careful consideration.

Western coal has been included in the new analysis for alternative solid fuels.

59. The analysis in the application for use of alternative low-sulfur fuels in combination with “natural scrubbing” does not identify specific types of coals, their costs, and their sulfur contents or include supporting information. Instead, the analysis simply compares a generic high sulfur coal and a generic low sulfur coal, concluding that the cost effectiveness of using the low sulfur coal, $366 <u>per pound</u> of SO2 removed, would be excessive. However, this value appears erroneous, likely because the reduction in SO_2 emissions that would accompany use of low sulfur coal is understated.

As correctly observed in this comment, this analysis did not correctly portray the cost-effectiveness of the use of a lower sulfur coal, for the reason identified in the comment.[33] Accordingly, a corrected analysis has been obtained from Mississippi Lime, as provided below. It addressed two alternative coals, coal from a local reserve of low sulfur coal whose continuing availability is uncertain and Powder Reserve basin coal. Both coals are considerably more expensive than "ordinary" local Illinois coal, which is available from several mines and does not pose concerns for continuing availability. The cost-effectiveness of use of other alternative coal is excessive considering total cost-effectiveness for control of SO_2 emissions.

Cost-Effectiveness Analysis for Alternative Low-Sulfur Solid Fuel

Total Annual Fuel Usage: 3,854,400 mmBtu

		Illinois High Sulfur Coal (baseline)	Illinois Low Sulfur Coal	Western Coal (Powder River Basin)
Coal Composition	% Sulfur	3.2	1.4	0.6
	mmBtu/ton	21.9	23	16.4
Cost per ton		$40	$72	$105
Annual Fuel Cost		$7,040,000	$11,859,692	$24,677,561
Potential SO_2 Emissions (tons)		282	115	71
Incremental Cost		-	$4,819,692	$12,817,869
Incremental Tons Removed		-	169	45
Average Cost-Effectiveness ($/ton removed)		-	$28,982	$83,554
Incremental Cost-Effectiveness ($/ton removed)		-	$28,554	$286,144

60. Because the analysis in the application lacked supporting information it is not clear whether it included as assessment of average cost-effectiveness or only incremental cost-effectiveness. The use of incremental cost effectiveness alone to reject a clean fuel (or any BACT option) is not consistent with USEPA Guidance.[34] Incremental cost effectiveness can only be used in combination with average cost-effectiveness. It should also only be used to compare technologies on the dominant cost curve. This requires plotting all pollution control options to create an "envelope of least-cost alternatives" "depicted by the curvilinear line connecting" the control options. Incremental cost effectiveness is

[33] **The historic analysis did not address Western coal but only addressed typical Illinois coal and a lower sulfur Illinois coal that is not widely available.**

[34] As explained in the NSR Manual at B.41 ("incremental cost effectiveness should be examined in combination with the total cost effectiveness in order to justify elimination of a control option."), B.43 ("As a precaution, differences in incremental cost among dominant alternatives cannot be used by itself to argue one dominant alternative is preferred to another."). The NSR Manual warns that "undue focus on incremental cost effectiveness can give an impression that the cost of a control alternative is unreasonably high, when, in fact, the total cost effectiveness, in terms of dollars per total ton removed, is well within the normal range of acceptable BACT costs." B.45-.46.

the difference in total annual costs between two contiguous control options that are on the dominant control curve. The consideration of incremental cost effectiveness is not to be used to reject an option merely because it costs more — even if it costs twice as much — as the next dominant alternative. B.43.

The new analysis provides information for both average and incremental cost-effectiveness. For this purpose, the cost for an alternative fuel is the additional cost for the plant with that fuel, not the total cost of that fuel.

61. The fundamental point to cost-effectiveness analysis is to document the different, if any, between the applicant's cost/ton for a control option (here low sulfur coal) and the cost/ton of others using that same control option. Other similar lime kilns have fuel sulfur limits that result in lower emissions that being proposed as BACT for this plant. For example, the Superior, Wisconsin, kiln has a fuel sulfur content of 2 percent. A permit issued for a kiln at that plant in the 1990s contains a BACT provision restricting the sulfur content to no more than 1 percent. See Wisconsin PSD Permit No. 93-DBY-074 (June 1, 1994). This is lower than the design fuel used for the proposed plant, but still high.[35] It should also be remembered that cost of control analysis are accurate within a range of about +/- 30 percent, so the cost to Mississippi Lime would have to exceed the costs to other kilns by at least that much to conclude that the control option is not cost effective).

The type of comparison discussed in this comment is not feasible for use of solid fuels. This is because the cost of solid fuels to different facilities can vary greatly based on their circumstances. For example, a "baseline" fuel for a plant depends on where it is located and the location of other users of coal who support shipping and terminal operations. As lime is a regional commodity, lime plants also compete with neighboring facilities rather than on a national marketplace. In this regard, the USEPA guidance that is the basis of this comment likely preceded the consideration of alternative fuels in BACT analyses, as now required.

62. I am concerned that the modeling results for the proposed plant, as presented in Tables 1 and 3 of the Project Summary, do not correspond to the modeling submitted in June 2010. That modeling, which used a screening model, addressed only one kiln and showed much higher 1-hour impacts (See Table 3-2 of the June 2010 submittal.) Adding the other kiln, as well as all nearby sources and background, would provide even higher results. Also, the Tables in the Project Summary showed the plant's impacts to be about half of what the applicant predicted the impacts to be from

[35] A federally-issued permit (under a then-delegated PSD program) for the Western Lime kiln in Green Bay, Wisconsin, contains a BACT limit restricting the sulfur content of its coal to no more than 0.9 percent. See Preconstruction Review and Preliminary Determination on a Proposed Modification of A Rotary Lime Kiln for The Western Lime and Cement Co., New Source Review #MIN-10-DLJ-81-05-180 (Jan 13, 1982).

the Load 8 Scenario in the June 2010 modeling (Full Operating Load Post-Coal Ramp-up). When the predicted impacts from the June, 2010, analysis are added to the background concentrations in the Project Summary, the results are higher than the NAAQS, without even accounting for the impacts from other nearby sources.

Table 3-2 from the June, 2010 did not actually address the proposed kilns. This supplement to the application addressed the relative impacts during startup for <u>an existing kiln</u> currently operated by Mississippi Lime, which is equipped with continuous emissions monitoring. It showed that the emissions during startup of a lime kiln are less than the emissions at full operating load. Therefore, the maximum-impact scenario for a kiln is normally when the kilns operate at full operating load, which was modeled. The numerical results presented in Table 3-2 are not <u>directly</u> applicable to the proposed kilns, only the relative impacts at different operating loads.

63. On June 28, July 6, July 15, and July 30, 2010, Mississippi Lime submitted revised modeling. There also appear to be discrepancies between the input data for exhaust gas temperature and velocity that were used in the various models run by the applicant. This further highlights that these parameters need to be made into enforceable permit requirements to ensure the modeling is representative of worst case conditions.

As these submittals addressed <u>different scenarios</u>, it is appropriate that the modeling used different inputs for the stack parameters for each scenario. The June 28th submittal contained preliminary modeling results to predict compliance with the new 1-hour NO_2 standard[36] and the $PM_{2.5}$ standards[37]. The modeling used input values for the proposed kilns and showed compliance with these NAAQS standards.

The July 6th submittal was the final report for the new 1-hour NO_2 NAAQS.[38] The July 15th submittal was the final report on the new $PM_{2.5}$ 24-hour and annual NAAQS[39].

The July 30th modeling submittal addressed a malfunction/breakdown scenario.[40] This report modeled actual data collected from continuous emission monitors <u>at an existing kiln</u> owned and operated by Mississippi Lime during an interruption lime production during an emergency.[41] The numerical data is not

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[36] *Preliminary Modeling Supplement – One-Hour NO_2 Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., June 25, 2010.
[37] *Preliminary Modeling Supplement – $PM_{2.5}$ Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., June 25, 2010.
[38] M*odeling Supplement – One-Hour NO2 Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., July 2, 2010.
[39] *Modeling Supplement – $PM_{2.5}$ Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., July 14, 2010.
[40] *Breakdown/Malfunction Modeling – Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., July 14, 2010.
[41] The interruption in production occurred when a train loadout suddenly became unavailable due to a train derailment. The plant immediately ceased production of lime,

directly applicable to the proposed kilns but demonstrates the relative changes in emissions during a breakdown/malfunction scenario. The applicant correctly modeled the scenario and no violations were predicted.

64. The July 30, 2010, submittal contained a 1-hour SO_2 NAAQS analysis. That analysis predicted a maximum modeled impact of 2757.4 µg/m^3. This far exceeds the applicable NAAQS, so the applicant conducted a so-called "culpability analysis" to assess "if the lime plant PSD project contributed significantly to the exceedance of the standard at the exact time and location where the exceedance was predicted by modeling." That analysis assumed that the kilns did not contribute (above a de minimis amount) to any predicted violation of the NAAQS as long as the contribution was less than 10 µg/m^3. However, USEPA guidance recommends using a significant impact level (SIL)[42] of only 3 µg/m^3 and notes that a SIL constituting 5 percent of a NAAQS (or more) is too high to be considered de minimus. The 10 µg/m^3 SIL that the applicant used is over 5 percent of the NAAQS. It is not clear from the record, but it appears likely that if a 3 µg/m^3 SIL is used, the plant contributes significant amounts to violations of the 1-hour SO_2 NAAQS.

When the 1-hour NAAQS for SO_2 was adopted by USEPA, the applicant was required to model the proposed plant to determine compliance with this new standard. There are several steps in the analysis according to USEPA guidelines[43]. First, the impact from the proposed source is assessed. Then, the model is run also including sources[44] within 100 kilometers of the proposed plant. If this air quality analysis predicts violations of the NAAQS, and the applicant can show that the emissions increase from the proposed source will not have a significant impact at the point and time of any modeled violation[45], then the application may proceed.

The initial 1-hour SO_2 model predicted a value of 2757.4 ug/m3. Since there was not yet a SIL developed for the new 1-hour SO2 standard, the Illinois EPA and USEPA Region V recommended to the applicant that the modeling methodology provided by USEPA for the new 1-hour NO_2 standard[46] be adapted for SO_2. Therefore, the

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discontinuing the limestone feed to the kiln. The kiln continued to be fired until a decision was made to either shut down the kiln or store lime elsewhere.

[42] A Significant Impact Level (SIL) is a regulatory tool is used to determine whether the predicted ambient impacts caused by a proposed source should be considered significant and, if so, whether the source's impacts should be considered to "cause or contribute to" any violations of the NAAQS that may be identified by modeling.

[43] ***New Source Review Workshop Manual – Prevention of Significant Deterioration and Non-Attainment Area Permitting,*** **Draft, October 1990. USEPA. page C.52**

[44] **These sources are those that meet certain guidelines defined by Illinois EPA and include those sources that are very close to the proposed source as well as those that meet a particular emission level.**

[45] **This process is referred to as the culpability analysis.**

[46] ***Notice Regarding Modeling for New Hourly NO_2 NAAQS*****, USEPA, February 25, 2010. Since no guidance for the SO_2 standard was available at the time of the modeling, the NO_2 guidance was adapted for use with 1-hour SO_2 taking into account the differences in form between NO_2 and SO_2.**

applicant used a screening level of 10 µg/m^3 (which corresponds to 4 ppb). The predicted high concentration after this "culpability analysis" was only 11.4 µg/m^3 which, when combined with the background concentration, is below the NAAQS.

65. I am concerned that the NAAQS modeling was not based on worst case operations. If worst case conditions cause the model to predict violations, then the permit must limit the proposed source from operating in that manner with permit conditions. Variables such as stack flow rate/velocity and temperature parameters will change as shown in the start-up scenario[47] and the breakdown scenario[48] and can have dramatic impacts on the modeling results. The worst possible combination of flue gas temperature and flow rate must be modeled. Iowa regularly makes stack flow rate and temperature enforceable permit conditions for this very reason. Illinois EPA must do the same here.

The modeling addressed by this comment does not predict exceedances from the <u>proposed kilns</u> during the startup sequence or during a breakdowns/malfunction scenario. The information provided in the June 8th supplement to the application[49] was based[50] on the continuous emissions monitors on an <u>existing kiln</u> owned and operated by Mississippi Lime. The information submitted showed the <u>relative effect</u> that all pollutant emission rates are lower during startup than at full load. Likewise, the information provided in the July 14th supplement to the application[51] was from the continuous emission monitors on an <u>existing kiln</u> owned and operated by Mississippi Lime. Again, it showed the <u>relative effect</u> of load reduction on the emissions, flue gas flow rate and temperatures, and air quality impacts of a lime kiln. The information demonstrated that nearly all pollutant emission rates decreased. NOx emission rates increased because fuel and air ratios were no longer optimized. The actual stack data and NOx emissions from the existing kiln were scaled in order to simulate an emergency breakdown/malfunction scenario for the proposed plant. This scenario was correctly modeled by the applicant and predicted no violations.

It is not the practice of the Illinois EPA to place requirements for stack flow rates and exhaust temperatures in permit conditions.

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[47] *Startup Modeling Supplement – Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., June 8, 2010.

[48] *Breakdown/Malfunction Modeling – Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., July 14, 2010.

[49] *Startup Modeling Supplement – Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., June 8, 2010.

[50] The data is from a kiln that used natural gas as its start-up fuel as opposed to the diesel fuel proposed for the Prairie du Rocher kiln. Emissions were calculated from natural gas to diesel based on mmBtu output and AP-42 emission factors.

[51] *Breakdown/Malfunction Modeling – Ambient Air Quality Impact Analysis – Prairie du Rocher Lime Plant*, Shell Engineering & Associates Inc., July 14, 2010.

66. USEPA is currently reconsidering the annual NAAQS for $PM_{2.5}$ and the NAAQS for ozone, proposing to tighten both standards. The USEPA is also further considering the NAAQS for CO. To the extent that revised NAAQS or PSD increments are adopted, permitting must address those standards before a permit can become final.

As observed by the comment, the permitting of the proposed plant can only address adopted standards. As a formal matter, the permitting of the proposed plant cannot address possible future standards, which may or may not be adopted by USEPA.[52]

67. Conditions 2.1.3-2(b) and 2.1.6 in the draft permit would set limits for NOx and SO_2 emissions that apply as a 3-hour averages. However, USEPA has adopted NAAQS for these pollutants that apply on a 1-hour period. A 3-hour average does not ensure compliance with a 1-hour standard. For example, a 3-hour average would allow all of the emissions to occur during one hour, effectively tripling the mass emission rate assumed by Illinois EPA in the modeling. Illinois EPA must ensure that the averaging time for the SO2 and NOx limits that Illinois EPA used to model NAAQS compliance are set at no greater than 1hour averaging periods.

The BACT emission limits for the kilns in Condition 2.1.3-2(b) for SO_2 and NOx emissions have an appropriate averaging time or compliance period. These limits address the performance of the control measures for these pollutants and the limits are set on an appropriate averaging time for this purpose. They are also consistent with the averaging times of other BACT determinations set for these pollutants. If these BACT limits were to be set on a shorter time period, the limits would have to higher to account for the normal variation in performance of control measures when considered over a shorter period of time. Rather than set such higher BACT limits, that would understate the typical performance of control measures, it is appropriate to maintain BACT limits that more closely address the typical performance of control measures and are consistent with historic practice.

The short-term emission limits for the kilns in Condition 2.1.6(a) for SO_2 and NOx also have an appropriate averaging time. As observed by this comment, the one-hour NAAQS for SO_2 and NOx were only recently adopted by USEPA and were not considered by historic USEPA guidance for PSD modeling. The preliminary experience of many state agencies is that the traditional approach to modeling can be overly conservative when used with these new standards, providing results that overstate impacts to such a degree that they cannot be considered credible. In particular, the dispersion modeling would assume that three worst case conditions occur

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[52] **On an informal or informational level, it may be observed that the adoption of a revised standards for $PM_{2.5}$, as now contemplated by USEPA, should not be expected alter the status of the area and the proposed plant.**

simultaneously, maximum background ambient air quality hourly concentrations from a year of monitoring, maximum short-term emission rates from existing sources, and worst-case hourly meteorological conditions for dispersion of emissions. Given these circumstances, it is appropriate to set short-term limits for SO_2 and NOx on a three hour averaging time to ameliorate for the unrealistic nature of the modeling process as it acts to overstate impacts. In addition, the specific circumstances that this comment speculates upon, i.e., with "triple emissions" occurring in a single hour, are not possible for the proposed kilns. The SO_2 and NOx emissions of the kilns are not controlled by natural scrubbing and process measures that cannot catastrophically fail, resulting in a scenario approaching the one postulated in this comment.

68. The Illinois EPA should verify that the conditions addressed in the "Breakdown Scenario" modeling submitted by the applicant on July 28, 2010, are not permitted. Specifically, that analysis showed that a "breakdown and idling" scenario would result in higher emissions in an individual hour than addressed by Condition 2.1.6(a) of the draft permit and would result in modeled impacts above the NAAQS. This analysis is concerning because it suggests that the source may expect to operate in the "breakdown and idling mode," so it should be clear that such operation is not allowed.

In fact, this supplementary analysis confirms that it is appropriate for the hourly emission limits for NOx in Condition 2.1.6(a) to be applied on a 3-hour average, as discussed above. Accordingly, continued operation during a breakdown-idling event that results in a 3-hour average NOx emission rate above the limit in Condition 2.1.6(a) would be a violation. This is appropriate as this analysis shows that NOx emissions above the hourly limit in Condition 2.1.6(a) during breakdown and idling events would likely not cause an exceedance of the 1-hour NO_2 NAAQS. During such events, based on this analysis, the NOx emissions of two kilns could be as high as 245 and 175 pounds per hour, respectively, and the NO_2 NAAQS would only be violated if the background NO_2 concentration during that hour, was 97 µg/m3 or more.[53] As breakdown and idling events are expected to occur for at most four times in a year, the likelihood of them coinciding with these background concentrations and worst-case meteorology is remote.

69. The Illinois EPA has not provided any basis for the limits it contends are BACT for units other than the kilns. At best, the Project Summary makes conclusions that certain limits are BACT. A complete top-down analysis must be made available to the public so that it can review how the Illinois EPA determined the limits and provide comments.

The Illinois EPA provided a summary of its basis or rationale for its proposed BACT determination for various emission units other than the kilns in the Project Summary that was prepared to

[53] This is only 80 percent of the maximum ambient background used in the air quality modeling, which was the background value from a monitoring station is East St. Louis.

accompany the draft permit. The application for the proposed plant also included a demonstration of BACT using the Top-Down process. The Illinois EPA's rationale for its determination of BACT has been further explained in the responses to comments on specific permit conditions.

70. When conducting its further analysis of its BACT determination for units at the plant other than the kilns, the Illinois EPA should consider the zero percent opacity limits established by Wisconsin DNR for non-kiln sources at a lime kiln in Superior, Wisconsin.

The Illinois EPA already considered prohibiting any visible emissions from units at the plant other than the kilns. The Illinois EPA determined that this was an appropriate determination of BACT as related to fugitive emissions from processing and handling of product lime and kiln dust. It is not appropriate for stack emissions from these operations as they would be controlled. While there may commonly not be any visible emissions from other non-kiln units at the plant, the nature of the units is such that emissions can be properly controlled and at times still have visible emissions. In part, this is because there would be no averaging period associated with such a prohibition, i.e., an instantaneous observation of visible emissions from any point on a subject unit would constitute a violation.

The actions of the Wisconsin DNR are not informative on this point. This is because it is not clear whether its prohibition of visible emissions applies to all non-kiln units at the cited plant or only certain units, e.g., handling of product lime. It is also not known whether there are aspects of Wisconsin rules that further clarify or refine the extent of its prohibition.

71. The application contains various emission factors for fugitive sources of particulates. Those estimates include assumptions of very high levels of controls, which the applicant apparently assumes can be achieved at all hours. For example, in Appendix C to the Application, the applicant identifies numerous fugitive emission points and assumes emission control of 75 to 99 percent. Those "controlled" emission rates were then used for modeling. However, the emission control percentages have no apparent basis.

The basis of the control efficiencies is stated in Appendix C. For example, for plant haul roads, 75 percent control efficiency reflects the level of control achieved with water spraying. For various conveyors transporting limestone, 90 percent control efficiency reflects the level of control achieved by the moisture in the stone and enclosure of the conveyor.

72. Dust emissions from unpaved roads, as well as possible control approaches, have been widely studied. Based on various references, use of watering for control of dust will typically yield short-term control efficiencies on the order of 50 percent.[54]

[54] The Midwest Research Institute indicates short-term 50 percent control for a water

Note also that these are short term efficiencies and frequency and time between applications of the control measure (watering, chemical suppressants, and/or sweeping) are critical. The 75 percent control efficiency assumed in the application is almost certainly unachievable, even if water were continuously applied, which is not required by the permit. The practice of continuous watering is impractical or impossible (especially during winter when watering is prevented by ice formation).

There are a number of factors that will contribute to the effectiveness of fugitive dust control at the proposed plant. Most significantly, it will be a private facility and Mississippi Lime will have control of essentially all aspects of the roadways at the plant. Water can be applied at regular intervals with adjustment made to the schedule made as needed to respond to weather conditions and the volume of vehicle traffic.

It is also recognized that effective control of roadways at the plant will necessitate application of water or other treatment at an appropriate frequency given the conditions experienced by the roadway.[55] However, this will not require "continuous watering." The proposed lime plant will have a relatively low volume of truck traffic, compared to plants handling more material or transporting it over longer distances.[56] This means that less frequent watering will be needed to maintain an adequate level of moisture on the surface of the roadways. While winter weather can make appropriate levels of treatment more challenging, it does not prevent applications of water or alternative treatments to roadways as

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application intensity of about 0.2 gallon/yard^2/hour (C. Cowherd et al., *Final Report: Control of Open Fugitive Dust Sources*, Midwest Research Institute, September 1988, p. 5-10). Hesketh, in *Fugitive Emissions and Controls*, lists 60 to 80 percent control for unpaved road with non-water wetting agents and 85 to 90 percent control with paving and sweeping (Howard Hesketh and Frank Cross, *Fugitive Emissions and Controls*, 1983, p. 42. 11-15). The South Coast Air Quality Management District suggests control efficiencies of 34 to 68 percent for watering of unpaved roads (South Coast Air Quality Management District, CEQA Air Quality Handbook, April 1993, pp. 11-15). The WRAP Fugitive Dust Handbook lists control efficiencies of 10 to 74 percent for watering of unpaved roads (Western Governor's Association, WRAP Fugitive Dust Handbook, November 15, 2004, p.3).

[55] **For unpaved roads, relationships between the frequency of watering, the rate of drying, the volume of traffic and the level of control are well recognized. For example, in the Background Document for Section 13.2.2 of AP-42, USEPA states "Watering increases the moisture content, which conglomerates particles and reduces their likelihood to become suspended when vehicles pass over the surface. The control efficiency depends on how fast the road dries after water is added. This in turn depends on (a) the amount (per unit road surface area) of water added during each application; (b) the period of time between applications; (c) the weight, speed and number of vehicles traveling over the watered road during the period between applications; and (d) meteorological conditions (temperature, wind speed, cloud cover, etc.) that affect evaporation during the period." Page 13.2.2-1 1, USEPA Background Document for Section 13.2.2.**

[56] **When these documents were cited in a similar comment submitted on the proposed Vulcan lime kiln in Manteno, Vulcan's consultant for that project, ACT, According to ACT, the volume of traffic at the plant will be as much as 100 times lower than those of the plants tested in the studies of emissions of industrial unpaved roads that are the basis of AP-42, Section 13.2.2. As such, the levels of vehicle traffic, which contribute to drying of the road surface, will be much lower at the proposed plant and the effectiveness of control between application of water will be higher.**

necessary for control of dust during periods when control is not provided by a natural coating of snow or ice.

The various references cited by this comment do not demonstrate that the emission rates required on roadways at the plant will be impossible to obtain. In this regard, the cited study by Cowherd and others is over 20 years old and does not address roadways at limestone and lime plants but public roadways.[57, 58]

73. As related to roadways at the proposed plant, the Illinois EPA must do one of the following before issuing the permit: (1) Model worst case emissions, assuming worst case silt, worst case moisture, worst case vehicle weight, worst case vehicle miles traveled, worst case vehicle weight, and worst case speed; or (2) Establish enforceable limits for each of those factors, including sufficient monitoring and recordkeeping, to ensure that the modeling done does represent worst-case conditions.

Neither of these actions is appropriate. As explained in response to comments on specific conditions of the permit, the permit appropriate limits emissions from roadways, in a manner that is enforceable and that would appropriately maintain emissions with the rates that were modeled.

74. Section 165(e)(2) of the Clean Air Act makes clear that the required ambient air quality for a proposed PSD project[59] must be

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[57] **In addition to being over 20 years old, the cited portion of the study by C. Cowherd and others addresses control of particulate matter emissions from "public roadways." As observed in the study, public roadways are distinguished from "industrial roadways," given the difference in ownership and supervisory control of roadways, but also the presence of curbs and relatively light traffic loadings. These are factors that constrain the numerical effectiveness of control of fugitive emissions from such roadways. In contrast, for industrial roads, the study observes that "Mitigative measures may be more practical for industrial plant roads because (1) the responsible party is known; (2) the roads may be subject to considerable spillage and carryout from unpaved areas; and (3) all affected roads are in relatively close proximity, thus allowing a more efficient use of cleaning equipment." Cowherd Study, page 2-11.**

[58] **When these documents were cited in a similar comment submitted on the proposed Vulcan lime kiln in Manteno, Vulcan's consultant for that project, ACT, also observed that this comment misrepresents the cited documents. Only the study conducted by the Midwest Research Institute by Cowherd and others should be considered a primary reference. The other cited documents are secondary references that summarize the results generated by the actual researchers. That is, neither Howard Hesketh nor Frank Cross actually conducted research of fugitive dust emissions from unpaved roads. ACT also is not aware of any unpaved road emission tests conducted independently by the South Coast Air Quality Management District or the WRAP Association. As such, these other documents appear to simply summarize data first published by others without any independent confirmation. The original research appears to have been focused on the impact on regional air quality of roadways, especially public roadways that were not subject to targeted cleaning programs. The documents do not specifically address roadways at plants in the limestone and lime industry.**

[59] A PSD permit application must contain an analysis showing protection of NAAQS and PSD increments with the proposed project. In this regard, Section 165(a)(7) of the Clean Air Act requires an applicant for a PSD permit to "… conduct such monitoring as may be necessary to determine the effect which emissions from any such facility may have, or is having, on air quality in any area which may be affected by emissions from such source." (Post-construction monitoring may be required as well to ensure that no air quality violations occur.) Section 165(e)(1) of the Clean Air Act further specifies that issuance of a PSD permit must "… be preceded by an analysis … by the State … or by the

conducted at the proposed site and affected areas specifically for the purpose of PSD permitting. The plain language of the Clean Air Act does not allow monitoring data gathered for a different purpose (such as state air quality planning) to be substituted.[60]

Given the ambient monitoring stations operated by the Illinois EPA in the general region in which the proposed plant would be located and the nature of this region, there is not a need for Mississippi Lime to conduct on-site preconstruction ambient monitoring to support its air quality analysis for the proposed plant. The ambient monitoring stations operated by the Illinois EPA provide the necessary data to support this analysis. More generally, $PM_{2.5}$ is the only pollutant of CO, NO_2, PM_{10}, $PM_{2.5}$ and SO_2 for which the air quality impacts of the proposed plant would not qualify to be summarily exempted from project-specific monitoring would be $PM_{2.5}$. The impacts of other pollutants are below the significant monitoring concentrations identified in 40 CFR 52.21(i)(5)(i).[61]

The interpretation of the Clean Air Act put forward by this comment, i.e., that ambient monitoring data must be collected specifically for the purpose of a proposed plant, is not supported by relevant rules, USEPA guidance, long-standing practice in PSD permitting, or decisions of the EAB.[62] It is also not supported

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major emitting facility applying for such permit, of the ambient air quality at the proposed site and in areas which may be affected….” Section 165(e)(2) of the Clean Air Act then specifies that this “preconstruction” analysis “shall include continuous air quality monitoring data gathered for purposes of determining whether emissions from such facility will exceed the [NAAQS or PSD increment].” and this data “… shall be gathered over a period of one calendar year preceding the date of application for a permit under this part unless the state determines that a complete and adequate analysis for such purposes may be accomplished in a shorter period.” The PSD rules also require an applicant to submit a pre-application analysis of ambient air quality in affected areas that includes at least one year of representative ambient air quality monitoring data. The NSR Manual further explains that compliance with the NAAQS “…is based upon the total estimated air quality which is the sum of the ambient estimates resulting from existing sources of air pollution (modeled source impacts plus measured background concentrations) and the modeled ambient impact caused by the applicant’s proposed emissions increase… and associated growth.” NSR Manual, page C.3.

[60] See also U.S. v. Louisiana Pacific Corp., 682 F. Supp. 1141, 1146 (D. Colo. 1988).

[61] **The maximum monitored concentration of $PM_{2.5}$, 24-hour average, is 4.54 $\mu g/m^3$, which is not less than 4 $\mu g/m^3$.**

[62] **For example, refer to the recent decision of the EAB in the case of Northern Michigan University, “At the outset, we reject Sierra Club’s contention that the plain language of the CAA and implementing regulations mandate the use of site-specific, sole-purpose preconstruction ambient air quality data. *See* Pet’n at 46-48 (quoting CAA § 165(a)(7), (e)(1)-(2), 42 U.S.C. § 7475(a)(7), (e)(1)-(2); 40 C.F.R. § 52.21(m)(1)(i), (iii)-(iv)); Reply to MDEQ at 25-26. In so arguing, Sierra Club overlooks statements of congressional intent to the contrary. H.R. Rep. No. 95-294, at 171 (1977) (“preconstruction, onsite air quality monitoring may be for less than a year if the basic necessary information can be provided in less time, or it may be waived entirely if the necessary data [are] already available”); H.R. Rep. No. 95-564, at 152 (1977) (Conf. Rep.) (one-year monitoring requirement “may be waived by the [s]tate”). EPA has long implemented the PSD program pursuant to the understanding that representative data may be substituted where circumstances warrant, *see*, *e.g.*, NSR Manual at C.18-.19; *Ambient Monitoring Guidelines* § 2.4, at 6-9, and the Board and its predecessors have long upheld the Agency’s guidance to that effect. *E.g.*, *Knauf*, 8 E.A.D. at 145-48; *Haw. Elec.*, 8 E.A.D. at 97-105; *Hibbing*, 2 E.A.D. at 850-52. Sierra Club has failed to persuade us to deviate from these precedents here.” *See* Northern Michigan University Ripley Heating Plant, agency’s 14 E.A.D. __, Slip Op. at 62-63 (EAB Feb. 18, 2009), pages 62 and 63.**

by a careful reading of the Clean Air Act. In particular, it does not consider the interrelationship between Sections 165(a)(2) and (e)(2) of the Clean Air Act or the full implications of the language of Section 165(e)(2) of the Clean Air Act. Section 165(a)(7) clearly states that permit applicants must "…conduct such monitoring as <u>may be necessary</u> to determine the effect which emissions for such facility may have, or is having on air quality…" [emphasis added]. While Section 165(e)(2) provides that a PSD applicant may be required to conduct site-specific pre-construction ambient monitoring for up to one year to support the air quality analysis for a proposed project, the relevant criteria for the actual extent of any continuous ambient monitoring is whether such monitoring is needed for a complete and adequate analysis of the impacts of the proposed project.

75. Section 165(e)(2) of the Clean Air Act also makes clear that the required ambient air quality monitoring must occur for at least 12 months unless, pursuant to the applicable USEPA regulations, a shorter period is allowed.

The ambient monitoring data used to determine background concentrations for the air quality analysis for the proposed plant satisfies this requirement. The ambient monitoring stations have been operated for many years.[63] This provides greater information on background ambient air quality than would be provided by project-specific monitoring conducted for only a single year.

76. Project-specific ambient monitoring was not conducted for purposes of assessing the potential air quality impacts of the proposed lime plant. Rather, the air quality analysis used data collected at existing ambient air quality monitors, which are operated by the Illinois EPA. The background concentrations that were used were obtained from monitoring stations as far away as East St. Louis and Houston, Illinois. This reliance on regional monitoring, which is conducted for purposes other than permitting of this proposed project, is not appropriate.

The reliance on air quality data collected at existing ambient monitoring stations operated by the Illinois EPA is fully appropriate. USEPA guidance provides that project-specific ambient monitoring is not needed when other acceptable ambient data is available. In particular, the NSR Manual, page C-19, states "If existing data are not available, or they are judged not to be representative, then the applicant must proceed to establish a site specific monitoring network."[64] However, in this case the

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[63] The ambient monitoring stations in the Illinois EPA's monitoring network are operated at the same locations for many years. This is done to collect data from fixed locations year after year to be able track trends in air quality. It is also necessary to evaluate air quality in the statistical format of the certain NAAQS, which requires consideration of air quality over a period of three years.

[64] The NSR Manual also explains "…if the location of the proposed source or modification is not affected by other major stationary point sources, the assessment of existing ambient concentrations may be done by evaluating available monitoring data. It is generally preferable to use data collected within the area of concern; however, the possibility of using measured concentrations from representative 'regional' sites may be

Illinois EPA found that available data, as collected at the existing ambient monitoring stations, was representative so that site-specific ambient monitoring was not required for the proposed plant.

77. Without conceding that the Clean Air Act requires preconstruction ambient monitoring, the existing regional ambient monitors used for the air quality analysis for the proposed plant do not meet the regulatory requirements for a waiver of preconstruction ambient monitoring. To receive approval to use data from a regional monitoring station, an applicant typically files a waiver request. A waiver request may only be granted if the applicant shows that valid, sufficient, and representative ambient air quality data already exists from regional monitoring stations. NSR Manual, pages C. 18 - 19. This is a difficult showing to make, requiring specific demonstrations on specific factors; it would only be possible in very limited circumstances.

This comment refers to the formal process whereby a permitting authority may allow or accept use of ambient monitoring data from a regional ambient monitoring station, by "waiving" the requirement for project-specific ambient monitoring. As already discussed, the Illinois EPA believes that such action is appropriate for the proposed plant.

As the comment claims that it is difficult to make the necessary showing for reliance on data from regional ambient monitoring stations, this claim is unsupported. USEPA's guidance on this subject, as summarized in the NSR Manual, only requires that the regional monitoring stations must provide data that is representative, of appropriate quality and current. These criteria are readily satisfied for the proposed project, as well as for most proposed PSD projects in Illinois. This is because of the nature of Illinois' ambient monitoring network. Ambient monitoring stations are sited to provide representative data for air quality in Illinois, as needed to support air quality planning and management in Illinois. These stations are also operated in accordance with quality assurance procedures so as to collect accurate data that can properly be relied upon for these purposes.[65, 66]

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discussed with the permitting agency. The PSD Monitoring Guideline provides additional guidance on the use of such regional sites." NSR Manual, page C.18.

[65] The reliance on regional ambient monitoring in PSD permitting in Illinois is also facilitated by the topography of Illinois, which is generally flat, with limited terrain features.

[66] It is also noteworthy that as new ambient air quality standards have been adopted that apply on more than an annual basis, the requirements of the Clean Air Act with respect to preconstruction ambient monitoring are inconsistent with those standards. That is, a single year of ambient monitoring cannot fully assess the status of a proposed site or area with respect to a NAAQS like the one for PM_{10}, for which measurements must be conducted over a period of three years. Regional monitoring networks, as they have stations operating for many years at a given location, are designed and operated to address these newer ambient air quality standards.

Incidentally, as this comment refers to a "waiver process," the comment acknowledges that it is accepted practice in PSD permitting to use ambient data from regional monitoring stations in place of project-specific monitoring data. Indeed, it refers to provisions of the NSR Manual that address this subject.[67]

78. Under USEPA guidance, existing monitoring data from regional sites is only sufficient in place of site-specific monitoring when specific determinations are made as to the data's adequacy. These determinations include: (1) monitor location; (2) quality of the data; and (3) currentness of the data. NSR Manual at page C.19, citing the *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*, EPA-450/4-87-007, May 1987 (*Ambient Monitoring Guidelines*)[68]; See also In re Northern Michigan University Ripley Heating Plant, agency's 14 E.A.D. __, Slip Op. at 62-63 (EAB Feb. 18, 2009) (remanding due to failure to explain how monitoring data from existing regional monitors satisfy the Clean Air Act or USEPA monitoring guidance); Hibbing Taconite, Slip Op. at 20 ("EPA allows substitution of existing representative data in lieu of having the source generate its own preconstruction monitoring data, provided these data meet the criteria in the 'Ambient Monitoring Guidelines for the Prevention of Significant Deterioration' (July, 1980)". If existing data are not "representative" based on the criteria in USEPA's guidelines, "…the applicant must proceed to establish a site-specific monitoring network." NSR Manual, page C.19. See also Louisiana Pacific, 682 F. Supp. At 1153 (USEPA refused to waive pre-construction monitoring required by 40 CFR 52.21(m)).

The ambient monitoring stations used to provide background levels of air quality meet these criteria. The monitors are sited to provide data that is representative of the project site. The monitoring was conducted to satisfy USEPA's requirements for quality of data. Lastly, the data is representative of current air quality at the project site.

79. The ambient monitoring data used for background concentrations do not fulfill the requirements of USEPA's guidance. To use data from existing ambient air quality monitors to determine baseline air quality for PSD permitting, USEPA's *Ambient Monitoring Guidelines,* Section 2.4.1, specify that the data must be representative of three specific areas: (1) the location(s) of maximum concentration increase from the proposed project; (2) the location(s) of the maximum air concentration from existing

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[67] **The claim in this comment that PSD applicants typically file "waiver requests" related to ambient monitoring is also not supported. In Illinois, the approach to ambient monitoring for a proposed project is commonly handled as part of the pre-application discussions about the modeling for a proposed project. In these discussions, a "modeling protocol" is commonly submitted by the modeling consultant for a proposed project for review and comment by the Illinois EPA. There is not a separate, distinct waiver request.**

[68] The USEPA's *Ambient Air Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*, EPA–450/4–87–007, USEPA, OAQPS, 1987, are referenced in 40 CFR Part 51 Appendix W, Guideline on Air Quality Models, which is in turn referred to by the PSD rules, 40 CFR 52.21(l)(1).

sources; and (3) the location(s) of the maximum impact area, i.e., where the maximum pollutant concentration would hypothetically occur based on the combined effect of exiting sources and the proposed project.[69]

The ambient monitoring stations used to provide background levels of air quality meet this criterion. For the proposed project, a single value for ambient background can be considered representative for all three locations. These criteria do not require the use of different values for background air quality at these locations.

80. Section 2.4.1 of USEPA's *Ambient Monitoring Guidelines* provides that when a proposed project would be in an area that has multiple sources and flat terrain, the applicant can only use representative monitoring data that is from (1) a nearby monitoring site, within 10 km of the points of emissions; or (2) from a monitor that is no more than 1 km away from either the maximum air pollutant concentration from existing sources or from the area(s) of combined maximum impact from existing and proposed sources. These criteria also were not met.

The proposed plant is more appropriately addressed as if its situation is that addressed by Case I in the *Ambient Monitoring Guidelines*, not Case II, as assumed by this comment. Case I addresses the situation where a proposed project is located in an area that is generally free from the impact of other point sources and area sources associated with human activities. In this situation, monitoring data from a regional ambient monitor, which may be characteristic of air quality across the region, may be used as representative data.[70] Other than an existing limestone crushing facility that is ceasing operation, there are no other sources in the immediate vicinity of the proposed project site. The proposed project is not located in an area in which the number and nature of the existing sources already in the area are such that existing background air quality cannot be reasonably be determined with sufficient accuracy to be protective of the NAAQS without conducting project-specific ambient monitoring.

In addition, based on the regulatory discussion of background concentrations in Section 8.2 of the Guideline on Air Quality Models, 40 CFR 51, Appendix W, it is not clear that regional monitoring is subject to the criteria referred to in this comment,.[71] When regional monitors are used to determine

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[69] See also Hibbing Taconite, 2 E.A.D. at 850.

[70] **In particular, Section 2.4.2(a) of the *Ambient Monitoring Guidelines* provides that the background monitoring site "… could be outside of the maximum impact area but must be similar in nature to the impact area. This site would be characteristic of air quality across a broad region including that in which the proposed source or modification is located. The intent of EPA is to limit the use of the 'regional' sites to relatively remote areas and not to use then in areas of multisource emissions or areas of complex terrain."**

[71] **Appendix W to Part 51—Guideline on Air Quality Models**
8.2 Background Concentrations
8.2.1 Discussion

background concentrations, the current or "background" impacts of existing major sources in the vicinity of the proposed project must be conservatively evaluated using dispersion modeling rather than data from ambient monitoring to assess their impacts. In addition, general background data for the area is evaluated in an appropriate form of maximum monitored air quality, rather than typical or actual air quality, as would be measured by a project-specific monitor.

81. The monitors providing the data used as background for the proposed project are 20 miles or more away from the proposed plant, whereas the maximum impacts from the plant are all within 1 km. Therefore, the existing monitors are nowhere near the location of the maximum increase in ambient concentrations from the proposed plant, the maximum impact from existing sources nearby to the proposed facility, or the location of the maximum impact from existing and proposed sources, much less the location of all three as required to substitute existing monitoring data. In fact, none of the modeling in the record even modeled an area extending out to where the existing background monitors are located. (In other words, the modeling which is supposed to capture all areas of any significant impacts does not overlap with any existing monitor locations.) In short, the preconstruction monitoring does not meet the location criteria and the permit cannot be issued.

Notwithstanding the arguments made in this comment, the ambient monitoring station at Houston, Illinois (which is the only one

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a. Background concentrations are an essential part of the total air quality concentration to be considered in determining source impacts. Background air quality includes pollutant concentrations due to: (1) Natural sources; (2) nearby sources other than the one(s) currently under consideration; and (3) unidentified sources.

b. Typically, air quality data should be used to establish background concentrations in the vicinity of the source(s) under consideration. The monitoring network used for background determinations should conform to the same quality assurance and other requirements as those networks established for PSD purposes. An appropriate data validation procedure should be applied to the data prior to use.

c. If the source is not isolated, it may be necessary to use a multi-source model to establish the impact of nearby sources. Since sources don't typically operate at their maximum allowable capacity (which may include the use of "dirtier" fuels), modeling is necessary to express the potential contribution of background sources, and this impact would not be captured via monitoring. Background concentrations should be determined for each critical (concentration) averaging time.

8.2.2 Recommendations (Isolated Single Source)

a. Two options (paragraph (b) or (c) of this section) are available to determine the background concentration near isolated sources.

b. Use air quality data collected in the vicinity of the source to determine the background concentration for the averaging times of concern. Determine the mean background concentration at each monitor by excluding values when the source in question is impacting the monitor. The mean annual background is the average of the annual concentrations so determined at each monitor. For shorter averaging periods, the meteorological conditions accompanying the concentrations of concern should be identified. Concentrations for meteorological conditions of concern, at monitors not impacted by the source in question, should be averaged for each separate averaging time to determine the average background value. Monitoring sites inside a 90° sector downwind of the source may be used to determine the area of impact. One hour concentrations may be added and averaged to determine longer averaging periods.

c. If there are no monitors located in the vicinity of the source, a "regional site" may be used to determine background. A "regional site" is one that is located away from the area of interest but is impacted by similar natural and distant man-made sources.

that is relevant for this discussion as it provided the background data for $PM_{2.5}$), is a representative monitor as it would overstate air quality levels that would be present at the project site. Houston, Illinois is a small rural community similar to Prairie du Rocher. Moreover, the monitoring at Houston is actually located in an area that is formally designated as a nonattainment area for $PM_{2.5}$, due to the presence of a major coal-fired power plant, Dynegy Baldwin.

82. This is also a "Case II" or "Case III" in the monitoring guidelines. The record, including the $PM_{2.5}$, NO_2 and SO_2 modeling by the applicant showing violations of the NAAQS and attributing those violations to non-Mississippi Lime sources, clearly demonstrates that this area is not free of impacts from other facilities. Moreover, to the extent the monitoring used as representative of "background" around the proposed plant is actually representative, that monitoring demonstrates that there are large impacts to ambient air quality by existing sources. Put another way, the monitoring Illinois EPA itself attempts to rely on belies any claim that this is a "Case I" in the guidelines.

The fact that potential exceedances of the NO_2 NAAQS were identified in the vicinity of existing sources some distance from the site of the proposed plant does not demonstrate that the selected background monitoring stations were inappropriately used. As observed in another comment, the maximum impacts of the proposed plant are all in its immediate vicinity, i.e., within 1 kilometer of the proposed plant site.

83. Even if the existing ambient monitoring could be used to provide background data for the air quality analysis for the proposed lime plant under limited circumstances, this monitoring must meet the same quality requirements as project-specific monitoring.[72] It is not clear that this is the case.

Illinois's ambient monitoring network is operated to meet the applicable "quality requirements" for ambient monitoring. This is a necessary aspect of the operation of this network, as collected data is relied upon for designations of attainment and nonattainment, development of attainment strategies, and general air quality planning. Compliance with these quality requirements is confirmed by periodic audits conducted by USEPA.[73]

84. Even if the Illinois EPA concludes that the existing regional monitor stations meet relevant criteria in the Ambient Air

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[72] These minimum requirements for ambient monitoring include: 1) Continuous instrumentation monitoring; 2) Documented quality control, including calibration, zero and span checks, and control checks; 3) Use of calibration and span gases certified by comparison to reference materials prepared by the National Bureau of Standards; and 4) Minimum 80 percent data recovery.

[73] **In addition, the Illinois EPA also operates certain automated ambient monitors using non-reference methods, notably for particulate, as indicator monitors. This is done to collect data to make forecasts of air quality under the Air Quality Index program and to issue air quality advisories.**

Monitoring Guidelines for use in lieu of site-specific preconstruction monitoring, the Illinois EPA must make a record (including specific facts and evidence and not conclusory statements) showing that each of the factors in the Guidelines is met. For example, what is the basis for any conclusion that the East St. Louis monitor, apparently used as background for 1-hour NO_2 and 1-hour SO_2, meets the location criteria and data quality criteria from the Guidelines? What basis, if any, does the Illinois EPA have for determining that the Houston, Illinois, monitor that was used for $PM_{2.5}$, meets those criteria?

The basis for the Illinois EPA's acceptance of background data from the selected ambient monitoring stations does not require the formal documentation requested in this comment. The monitoring station in East St. Louis is in the St. Louis major metropolitan area, directly across the Mississippi River from the City of St. Louis. As such, it would provide very conservative values for ambient backgrounds. The Houston monitoring station, which is only about 20 miles away from the proposed plant site, is also a small rural community similar to Prairie du Rocher.

85. The air quality modeling for the proposed plant used five years of meteorological data collected by the National Weather Service (NWS) at the St. Louis International Airport. Use of the meteorological data from this airport is unacceptable for a number of reasons.

The modeling appropriately used meteorological data from the St. Louis Airport, as well as data for certain meteorological parameters collected by the NWS at the Lincoln Logan County Airport in Illinois. The USEPA's Guideline on Air Quality Models (40 CFR Part 51, Appendix W, Section 8.3.1.2) indicates that five years of off-site data, as were used for the modeling of the proposed plant, are acceptable for air quality modeling when the NWS data would be representative of the site of a proposed project.[74] While the St. Louis Airport is surrounded by

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[74] Refer to USEPA's Guideline on Air Quality Models, Appendix W to Part 51
"8.3 Meteorological Input Data
a. The meteorological data used as input to a dispersion model should be selected on the basis of spatial and climatological (temporal) representativeness as well as the ability of the individual parameters selected to characterize the transport and dispersion conditions in the area of concern. The representativeness of the data is dependent on: (1) The proximity of the meteorological monitoring site to the area under consideration; (2) the complexity of the terrain; (3) the exposure of the meteorological monitoring site; and (4) the period of time during which data are collected. The spatial representativeness of the data can be adversely affected by large distances between the source and receptors of interest and the complex topographic characteristics of the area. Temporal representativeness is a function of the year-to-year variations in weather conditions. Where appropriate, data representativeness should be viewed in terms of the appropriateness of the data for constructing realistic boundary layer profiles and three dimensional meteorological fields, as described in paragraphs (c) and (d) below.
b. Model input data are normally obtained either from the National Weather Service or as part of a site specific measurement program. Local universities, Federal Aviation Administration (FAA), military stations, industry and pollution control agencies may also be sources of such data. Some recommendations for the use of each type of data are included in this subsection.

development, the area of the secured operating area at the airport is 2.8 square miles. This allows collection of meteorological data that is representative of the region, as is necessary both for operation of aircraft and for other purposes for which data collected by the NWS is used.

86. The dispersion modeling for Mississippi Lime's proposed lime plant should use one year of site-specific meteorological data, consistent with USEPA Meteorological Monitoring Guidance for Regulatory Modeling Applications, rather than data from the St. Louis Airport, which is located roughly 50 miles north of the proposed plant site.

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c. Regulatory application of AERMOD requires careful consideration of minimum data for input to AERMET. Data representativeness, in the case of AERMOD, means utilizing data of an appropriate type for constructing realistic boundary layer profiles. Of paramount importance is the requirement that all meteorological data used as input to AERMOD must be both laterally and vertically representative of the transport and dispersion within the analysis domain. Where surface conditions vary significantly over the analysis domain, the emphasis in assessing representativeness should be given to adequate characterization of transport and dispersion between the source(s) of concern and areas where maximum design concentrations are anticipated to occur. The representativeness of data that were collected off-site should be judged, in part, by comparing the surface characteristics in the vicinity of the meteorological monitoring site with the surface characteristics that generally describe the analysis domain. The surface characteristics input to AERMET should be based on the topographic conditions in the vicinity of the meteorological tower. Furthermore, since the spatial scope of each variable could be different, representativeness should be judged for each variable separately. For example, for a variable such as wind direction, the data may need to be collected very near plume height to be adequately representative, whereas, for a variable such as temperature, data from a station several kilometers away from the source may in some cases be considered to be adequately representative. …

8.3.1 Length of Record of Meteorological Data

8.3.1.1 Discussion

a. The model user should acquire enough meteorological data to ensure that worst-case meteorological conditions are adequately represented in the model results. …

8.3.1.2 Recommendations

a. Five years of representative meteorological data should be used when estimating concentrations with an air quality model. Consecutive years from the most recent, readily available 5-year period are preferred. The meteorological data should be adequately representative, and may be site specific or from a nearby NWS station. Where professional judgment indicates NWS-collected ASOS (automated surface observing stations) data are inadequate {for cloud cover observations}, the most recent 5 years of NWS data that are observer-based may be considered for use….

8.3.2 National Weather Service Data

8.3.2.1 Discussion

a. The NWS meteorological data are routinely available and familiar to most model users. Although the NWS does not provide direct measurements of all the needed dispersion model input variables, methods have been developed and successfully used to translate the basic NWS data to the needed model input. Site specific measurements of model input parameters have been made for many modeling studies, and those methods and techniques are becoming more widely applied, especially in situations such as complex terrain applications, where available NWS data are not adequately representative. However, there are many model applications where NWS data are adequately representative, and the applications still rely heavily on the NWS data. …

8.3.2.2 Recommendations

a. The preferred models listed in Appendix A all accept as input the NWS meteorological data preprocessed into model compatible form. If NWS data are judged to be adequately representative for a particular modeling application, they may be used. …

The air quality analysis for the proposed plant was properly conducted using meteorological data from the St. Louis Airport rather than data from a site-specific monitoring station set up in the vicinity of the proposed plant site. Even though the St. Louis Airport is not close to the proposed plant site, meteorological data from this airport can be used in a manner that is adequate to assess the potential air quality impacts from the proposed plant. Among other things, as discussed, this is because of the topography and weather patterns of the broad geographical region in which both the plant site and the airport are located. In this regard, the airport and the plant site are not separated by a range of mountains or other topographical features that would result in different weather patterns, when considered over the course of years. The use of five years of meteorological data, rather than only the one year of data that would be used if a site-specific data were collected, ensure that the full range of meteorology that would be experienced at the project site are modeled.

87. The major issue is the quality of the meteorological data used for this permit. It is important to remember that the airport data are not collected with the thought of air dispersion modeling in mind. For example, the airport data used here include meteorological parameters that were reported once per hour, based on a single visual observation (usually) taken in the last ten minutes of each hour. The USEPA recommends that sampling rates of 60 to 360 times per hour, at a minimum, be used to calculate hourly-averaged meteorological data. Air dispersion modeling requires hourly-averaged data, which represents the entire hour being modeled, and not the once-per-hour snapshot represented by airport data.

In addition, the airport data used were not subject to the system accuracies required for meteorological data collected for air dispersion modeling. The USEPA recommends that meteorological monitoring for dispersion modeling use equipment that are sensitive enough to measure all conditions necessary for verifying compliance with the NAAQS and PSD increments. For example, low wind speeds (less than or equal to 1.0 meter per second) are usually associated with peak air quality impacts – this is because modeled impacts are inversely proportional to wind speed. Following USEPA guidance, wind speed measuring devices (anemometers) should have a starting threshold of 0.5 meter per second or less. The wind speed measurements should be accurate to within plus or minus 0.2 meter per second, with a measurement resolution of 0.1 meter per second.
The airport data used in the modeling here, rather than being measured in 0.1 meter per second increments, are based on wind speed observations reported in whole knots. This is evidenced by examining the meteorological data files. Every modeled hourly wind speed in these data sets is an increment of whole knots. The once-per-hour observations at the Rockford Airport (in whole knots, no fractions or decimals) are simply converted to meters per second and can therefore be back-converted to the whole knot measurements originally reported by the airport.

To further exemplify the problem of using airport data, the meteorological data files from the airport include an unacceptably large percentage of calm hours. Typically, when properly measured with modern anemometers, there are only a few calm hours in a meteorological data base per year,[75] whereas the data from the Rockford Airport used here include thousands of calm hours. In AERMOD, calms are identified when the reported wind speed is 0.0 meter per second. At airports, any wind speed less than three knots (1.54 meters per second) are automatically regarded as calm, even if the wind is not entirely still. The purpose of this reporting procedure is simple: winds less than three knots do not pose a concern for pilots, so airports identify all low wind speed conditions as calm. The problem with using these data for air permitting, however, is that the best wind conditions for landing and take offs (low wind speeds) are the worst-case conditions for air modeling impacts. Using airport data that show no periods with wind speeds less than three knots results in a bias of under-predicted highest modeled air impacts. This is particularly true for low-level fugitive PM_{10} emissions, which are widely present at the site at issue here.[76] Without a doubt, the conditions most crucial for verifying compliance with the NAAQS and PSD increments (low wind speeds) are excluded from the modeling analysis for this permit because of the use of airport data. This is particularly disconcerting here, given that AERMOD is designed to handle wind speeds less than one meter per second, but the model has not been put to this full use. Excluding the calm hours from modeled concentrations favors the project proponent and is in appropriate given the improved capabilities of AERMOD.

Sensitive and accurate measurements of wind speeds are necessary for measuring winds down to 0.5 meter per second (about one knot), which can then be used as valid hours in the air dispersion modeling analyses. There would be no need to label such low wind speed hours as calm, which will greatly increase the number of hours included in the modeling analyses. It is these low wind speed hours that must be included in the modeling data set for realistically verifying compliance with the NAAQS and PSD increments.

In addition to excluding the worst-case air quality conditions (calm hours), the airport data set has many missing hours. Together, the calm and missing hours make up a significant percentage of the total data set used for modeling. To make matters worse, the data that are used for the analyses were sanitized of the very wind conditions that cause the highest modeled impacts.

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[75] For example, the 10-meter pre-construction monitoring data set for the Newmont Nevada proposed coal-fired power plant has five calm hours in the one-year period from 9/1/2003 through 8/31/2004.

[76] Scire, Joseph S., Comments on the 9th Conference on Air Quality Modeling, Research Triangle Park, North Carolina, October 9-10, 2008.

Even if the statements made in this comment were applicable to meteorological data collected at the St. Louis Airport, this comment would not show that the data was inadequate for the purpose for which it was used, i.e., the modeling of the proposed plant to demonstrate that it would not threaten the NAAQS or PSD Increments. The St. Louis Airport data was collected by the NWS, which is an authoritative source for such data, as it is a government agency that specializes in the collection of weather data. USEPA's formal guidance concerning dispersion modeling clearly shows that NWS data is generally acceptable, subject to considerations of representativeness, and does not identify concerns with the quality of NWS data.[77] As such, data from the NWS weather station at the St. Louis Airport, a site whose weather would be similar to and representative of weather at the location of the proposed project, can be relied upon for modeling of the proposed plant.[78] As AERMOD is an approved model for PSD modeling, the manner in which it currently addresses calms does not alter this conclusion.[79, 80, 81, 82]

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[77] USEPA also addresses use of meteorological data from the National Weather Service (NWS) in its *Meteorological Monitoring Guidance for Regulatory Modeling Applications*, EPA 454/R-99-005. February 2000.
"Section 8.3.2.1
a. The NWS meteorological data are routinely available and familiar to most model users. Although the NWS does not provide direct measurements of all the needed dispersion model input variables, methods have been developed and successfully used to translate the basic NWS data to the needed model input. Site specific measurements of model input parameters have been made for many modeling studies, and those methods and techniques are becoming more widely applied, especially in situations such as complex terrain applications, where available NWS data are not adequately representative. However, there are many model applications where NWS data are adequately representative, and the applications still rely heavily on the NWS data.
b. Many models use the standard hourly weather observations available from the National Climatic Data Center (NCDC). These observations are then preprocessed before they can be used in the models."

[78] Calms and missing data would also be present if meteorological data was collected by a site-specific monitoring station. In addition, concerns could be present about the data collected at such a station as it would be operated for a limited period of time at a remote, unmanned site, by a contractor working for Mississippi Lime.

[79] The occurrence of calms is addressed in Section 8.3.4.2(a) of 40 CFR 51, Appendix W. "Hourly concentrations calculated with steady-state Gaussian plume models using calms should not be considered valid; the wind and concentration estimates for these hours should be disregarded and considered to be missing. Critical concentrations for 3-, 8-, and 24-hour averages should be calculated by dividing the sum of the hourly concentrations for the period by the number of valid or non-missing hours. If the total number of valid hours is less than 18 for 24-hour averages, less than 6 for 8-hour averages or less than 3 for 3-hour averages, the total concentration should be divided by 18 for the 24-hour average, 6 for the 8-hour average and 3 for the 3-hour average. For annual averages, the sum of all valid hourly concentrations is divided by the number of non-calm hours during the year. AERMOD has been coded to implement these instructions."

[80] While AERMOD is mathematically capable of calculating concentrations for wind speeds of less than 1 meter per second, it has not been validated for wind speeds less than 1 meter per second. USEPA is working with modelers to develop refinements to AERMOD that would improve the way in which calms to enable validation of AERMOD at lower wind speeds. USEPA is also working with modelers to improve the way that missing data is handled.

[81] This comment is incorrect in stating that wind speeds less than three knots (1.54 meters per second) are regarded as calms. As an ASOS station, wind speeds greater than two knots are measured and recorded and are not reported as calms. Refer to the ASOS Users Guide. Section 3.2.1 of the Users Guide states that "the sensor's starting

88. For purposes of air dispersion modeling, airport data is the least desirable because it suffers problems related to location and quality. The USEPA's *Meteorological Monitoring Guidance for Regulatory Modeling Applications*[83] notes the general concern about airport data:

> For practical purposes, because airport data were readily available, most regulatory modeling was initially performed using these data; however, one should be aware that airport data, in general, do not meet this guidance. Guidance, Page 1-1.

Modeling for the proposed project was conducted with the AERMOD model, which requires specific data to characterize the atmospheric boundary layer and upper air dispersion. The meteorological data collected at the Rockford Airport is not adequate to provide AERMOD with the necessary data to provide realistic results, that is, the results of AERMOD with airport data are not the most representative of real conditions. Airport data (like that from the Rockford Airport) is not collected for purposes of air dispersion modeling. For example, the data is recorded and reported once per hour, based on a single visual reading (usually) taken in the last ten minutes of each hour. This does not meet USEPA's recommended practice of automatically recording data multiple times per hour to calculate hourly-averaged data. Additionally, data collected at the Rockford Airport is not subject to the recommended system accuracies. The USEPA recommends that meteorological data be collected with equipment sensitive enough to measure all conditions needed to verify compliance with the NAAQS and PSD increments.[84]

While meteorological data collected at the Rockford Airport may have certain deficiencies, as noted by this comment, this data is

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threshold for response to wind direction and wind speed is 2 knots. Winds measured at 2-knots or less are reported as calm." (http://www.nws.noaa.gov/asos/pdfs/aum-toc.pdf).

[82] **The wind speed data collected for the proposed Newmont Nevada Energy power plant project near Dunphy, Nevada, cited by this comment should not be considered to be indicative of wind speeds at the proposed plant site. The Nevada Energy project would be located in the high desert of north central Nevada, an area that is not at all representative of the meteorology in the St. Louis region.**

[83] USEPA, Meteorological Monitoring Guidance for Regulatory Modeling Applications, EPA-454/R-99-05, February 2000, p. 1-1 (*available at* http://www.epa.gov/scram001/guidance/met/mmgrma.pdf).

[84] For example, low wind speeds (less than or equal to 1.0 meter per second) are usually associated with peak air quality impacts, as impacts are inversely related to wind speed. USEPA guidance provides that anemometers to measure wind speed should have a starting threshold of no more than 0.5 meter per second and measurements should be accurate to within plus or minus 0.2 meter per second, with a measurement resolution of 0.1 meter per second. However, the Rockford Airport is not in 0.1 meter per second increments but instead in whole knots. This was confirmed by an examination of the meteorological data files for the Rockford Airport. The data for wind speed was originally in whole knots, not to the nearest tenth of knot. The hourly data from the Rockford Airport was then converted from knots to meters per second. Data meeting USEPA's guidance would not have whole knot values for each hour. The data in whole knots does not meet USEPA's guidance and also does not account for the low wind speeds that are associated with the highest air quality impacts.

still appropriately used for the air quality analysis conducted for the proposed project.[85, 86] Moreover, this comment does demonstrate that the presence of any such deficiencies in the meteorological data affected the results of the modeling for the proposed project in any meaningful way. As a general matter, the presence of any deficiencies in the meteorological data is addressed by the fact that the dispersion modeling was conducted over a period of five years rather than for a period of one year, as would otherwise be acceptable if site-specific meteorological data had been collected for the proposed project. This increase in the breadth of the duration of the modeling simulation compensates for the difference in the quality of meteorological data that might have been available if site-specific meteorological data had been collected.

In this regard, this comment selectively quotes from the cited USEPA document, overlooking statements in that document confirming the acceptability of meteorological data collected at airports, as well as the need to routinely rely on certain meteorological data that is typically only available from the NWS stations at airports In particular, in the cited document, USEPA specifically addresses meteorological data collected at airports, confirming that it is generally acceptable for modeling.[87] Moreover, it is also relevant that the cited document is specifically directed at appropriate practices for collection of meteorological data when a project-specific weather station is established for the specific purpose of collecting data to support development of regulations.[88] The document does not directly address the collection of meteorological data for support of PSD applications, much less appropriate procedures for performance of PSD modeling. These are the subject of different guidance documents prepared by USEPA,

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[85] The comment regarding "rounding" of data within 3 knots, if accurate, is neither appropriate nor relevant. The data for wind speed from the Rockford Airport were provided by the National Data Climatic Center and were directly input to AERMET without further conversion or rounding.

[86] The comment stating that Rockford NWS only records a "snapshot" of the wind speed once per hour is incorrect. As an ASOS-qualifying station, data for wind speed and direction is measured much more frequently and compiled to produce data for average wind speed and direction.

[87] In Section 6.7 of *Meteorological Monitoring Guidance for Regulatory Modeling Applications*, USEPA states "Although data meeting this guidance are preferred, airport data continue to be acceptable for use in modeling. In fact observations of cloud cover and ceiling, data which traditionally have been provided by manual observation, are only available routinely in airport data; both of these variables are needed to calculate stability class using Turner's method (Section 6.4.1). The Guideline on Air Quality Models [1] recommends that modeling applications employing airport data be based on consecutive years of data from the most recent, readily available 5-year period."

[88] USEPA's *Meteorological Monitoring Guidance for Regulatory Modeling Applications,* EPA-454/R-99-005, USEPA, OAQPS, February 2000, as referenced by this comment, does not apply to collection of data by the NWS, which as already discussed, is acceptable for modeling if certain conditions are met, e.g., a full five years of data is modeled. Rather, this document provides guidance for meteorological monitoring programs under the control of a permit applicant or permitting authority. "Guidance is provided for the in situ monitoring of primary meteorological variables (wind direction, wind speed, temperature, humidity, pressure, and radiation) for remote sensing of winds, temperature, and humidity, and for processing of derived meteorological variables such as stability, mixing height, and turbulence." Page 1-1.

notably USEPA's various guidelines on air quality modeling. In this regard, in accordance with USEPA's current Guideline on Air Quality Models, as already discussed, USEPA has specifically considered and allowed for the use of NWS meteorological data, as collected at airports, with AERMOD.

89. Given the threat posed by global warming, it is now more important than ever to implement the federal Clean Air Act's requirement to impose stringent BACT limits on GHG emissions from new coal-fired facilities.

The threat posed by global warming and climate change does not provide a legal basis to set BACT limits on the GHG emissions of the proposed plant. This is because GHG are not yet a regulated pollutant for purposes of the federal PSD program. In addition, the threat posed by global warming and climate is not a direct and immediate result of the GHG emissions of the proposed plant. Rather, the threat is the secondary result of national and global emissions of GHG in total. Subjecting the proposed plant to a BACT limit would do little to meaningfully address overall emissions of GHG to the atmosphere. At the same time, it would delay a project that would comply with current environmental requirements.

90. I contend that GHG are presently a regulated pollutant for purposes of the federal PSD program. GHG are clearly a pollutant. The USEPA has issued an endangerment finding for GHG in which found that they "may be reasonably anticipated to endanger public health and welfare," as defined under the Clean Air Act. In addition to being an "air pollutant," CO_2 also qualifies as subject to regulation under the Clean Air Act because it is actually regulated under the Act in a number of ways. For example, Section 821 of the Clean Air Act Amendments of 1990 required USEPA to promulgate regulations to require certain sources, including coal-fired electric generating stations, to monitor CO2 emissions and report monitoring data to USEPA. More recently, in the Fiscal Year 2008 Consolidated Appropriations Act, Congress specifically required USEPA to undertake rulemaking to establish monitoring and reporting requirements for emissions of GHG. For this purpose, it instructed the USEPA "to use its existing authority under the Clean Air Act."

The various actions cited by this commenter and by others who contend that GHG are currently regulated pollutants for purposes of the PSD program can overcome the actions and declarations by USEPA on this issue. USEPA has, by rule, set a date in the future when GHG will become a regulated pollutant for purposes of PSD. It also has declared that the various actions that have previously occurred with respect to emissions of GHG is sufficient to constitute regulation of GHG under, as it construes that the term regulation. As a delegated authority for USEPA for the PSD program in Illinois, the Illinois EPA is also obligated to proceed in accordance with these directives by USEPA.

91. CO_2 is currently subject to regulation under the Clean Air Act because 35 IAC 201.141 prohibits emissions that cause "air pollution."[89] Anthropomorphic emissions of CO_2 are causing global warming and climate change, a form of air pollution, and will continue to do so until abated. 35 IAC 201.141 is directly enforceable and does not require pollutant-specific standards or rules to be adopted first. See e.g., Fleishmann Malting Co. v. Ill. Pollution Control Bd., 329 N.E.2d 282, 285 (Ct. App. 5th Dist. 1975) (and collected cases). As uncontrolled CO_2 emissions cause air pollution, they are prohibited by 35 IAC 201.141, to the extent they contribute to air pollution through global warming. This rule is included in Illinois' SIP (40 CFR Part 52, Subpart O). Accordingly, CO_2 is subject to regulation under the Clean Air Act and a BACT limit is required before a PSD permit can be issued for the proposed plant.

The proposition argued in the comment is flawed. 35 IAC 201.141 does not impose an independent obligation under state law to address CO_2 emissions under the PSD program. Rather, this rule is a general prohibition. It prohibits certain actions by sources but it does not require control of or set emission standards for any particular pollutants. It does not provide legal authority for the Illinois EPA to control or restrict CO_2 emissions of the proposed plant during permitting.

92. In addition to being required to set BACT limits for GHG emissions from the proposed plant, the Illinois EPA is authorized to take steps to avoid or minimize such emissions, including the authority to set limits for GHG emissions and/or require offsets for GHG emissions. One source of such authority is Section 165(a) (2) of the Clean Air Act. It gives a PSD permitting authority broad discretion to impose permit conditions that go beyond the basic requirements of BACT in order to protect air quality.[90] Under this authority, the Illinois EPA should consider such additional permit conditions on its own initiative.

This comment does not demonstrate that the permit for the proposed plant should address GHG emissions. While a PSD permitting authority may have authority to impose conditions in a PSD permit to protect air quality, that authority is used to address emissions of regulated pollutants for which air quality standards have been set. Moreover, that authority is used in circumstances where there is a more direct linkage between the emissions of a pollutant and air quality than is currently present with GHG emissions. Comments have not been submitted that show that the presence in the atmosphere of GHG emissions from the proposed plant directly constitutes a threat to air quality. Rather the plant's emissions of GHG would be an indirect threat to the environment, as they contribute to global warming and climate

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[89] As defined by 35 IAC 201.102, "Air pollution" is "the presence in the atmosphere of one or more air contaminants in sufficient quantities and of such characteristics and duration as to be injurious to human, plant, or animal life, to health."
[90] Refer to In re Prairie State Generating Co., PSD Appeal No. 05-05, slip op. at 40 (EAB. 2006), quoting NSR Manual at page B.13.

change. In this regard, emissions of GHG are similar to the emissions of the acidic precursors that contribute to acid rain and the emissions of ozone depleting substances that contribute to depletion of stratospheric ozone. In both cases, the environmental problem posed by emissions of these pollutants were addressed by comprehensive regulations for control of the precursor pollutants, not by case-by-case actions on permit applications, independent of other authority to regulate emissions of the relevant precursor pollutant. While USEPA has determined that GHG must shortly be addressed as regulated pollutants under the Clean Air, given current law, the USEPA has also been clear that GHG would be much better addressed under a new federal law appropriately addresses emissions of GHG, with measures to reduce GHG emissions of existing sources, as well as measures to minimize GHG emissions of new sources.

Incidentally, Section 165(a)(2) of the Clean Air Act does not actually provide the authority or act in the manner indicated by this comment. This provision of the Clean Air Act addresses the procedural steps that must take place before a PSD permit may be issued. The ability of permitting authorities to include conditions in federal PSD permits and the nature and extent of such authority has been established through USEPA policy and review of permits by the EAB upon appeal. As related to alternatives to a proposed project, Section 165(a)(2) only provides that a permitting authority must accept public comments that address alternatives to the proposed project and, presumably, appropriately respond to those comments.

93. The USEPA has also found that a "PSD permitting authority has discretion under the Clean Air Act to modify the PSD permit based on comments raising alternatives or other appropriate considerations." Brief of the USEPA, Office of Air and Radiation and Region V, In re Prairie State, PSD Appeal 05-05, 12 E.A.D. 176 (EAB, Aug. 24, 2006). Here, these comments expressly require Illinois EPA to fulfill this duty. Moreover, the EAB has made clear that a permitting authority has discretion to modify a permit based on consideration of "alternatives," whether or not commenters raise the issues

Indeed, the permit authority is not required to wait until an "alternative" is suggested in the public comments before it may exercise the discretion to consider the alternative. Instead, the permitting authority may identify an alternative on its own. This interpretation of the authority conferred by Clean Air Act Section 165(a)(2)'s reference to "alternatives" is consistent with the USEPA's longstanding policy that "...this is an aspect of the PSD permitting process in which states have the discretion to engage in a broader analysis if they so desire." See In re Prairie State, PSD Appeal 05-05 (Aug. 24, 2006) (quoting the NSR Manual at B.13).

Accordingly, the Illinois EPA can engage in a wide-ranging exploration of options. It also has the discretion to require specific evaluation and control of CO_2 emissions, and/or to

require other action to mitigate potential global warming impacts. Failure to do so in this case would be a material breach of the Illinois EPAs obligations.

To date, there has been no specific assessment of available measures or options to reduce the expected GHG emissions from the proposed plant. The Illinois EPA must consider and could require any number of possible actions to address the CO_2 footprint of the proposed plant. Options include requiring construction of a more efficient plant, use of biomass fuel, use of a less polluting fuel to run plant processes, and requiring the purchase of CO_2 offsets, or some combination of these approaches or others. Offsets can be an essential component of reducing CO_2 emissions because they can be implemented quickly for a relatively low cost, such as programs to increase the energy efficiency in buildings, factories or transportation, generating electricity from renewable energy sources like wind or solar, shutting down older and less efficient power plants, and capturing CO_2 in forests and agricultural soils. An advantage of offsets is that they often result in other environmental, social, and economic co-benefits such as reductions in emissions of other pollutants, restoration of degraded lands, improvement in watersheds and water quality, and creation of jobs and lower prices for electricity and gasoline.

The Illinois EPA has appropriately considered the "new" suggestions made by this comment as suggested alternatives for the proposed plant. Further consideration for the use biomass fuel is not needed, as it has already considered. It was determined to be infeasible given the size and circumstances of the proposed plant. Use of lower emitting fuels has also already been considered.

With regard to the efficiency of the plant, it should generally be assumed that the plant will be designed with equipment and features that can be safely operated and provide an appropriate balance of capital cost, operating cost, reliability, and efficiency, as would be present with the design of a major new manufacturing plant. As the plant would have multiple systems that must operate together in an integrated manner and efficiency would only be one factor in the design of the plant, it should not be expected that an independent evaluation of the design of the plant would be able to identify a more efficient design that would satisfy other needs that must be met by the design of the plant.[91] However, as the plant's thermal efficiency is relevant to emissions of NOx and CO, a design standard for the preheaters on

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[91] **In this regard, the design of the proposed plant should not be compared to the selection process that might be followed by an individual for purchase of a new refrigerator or other appliance. That is a far simpler process as that individual is picking from a limited number of models of a particular type of unit that generally meet his or her needs. Considering the suitable units, the individual must then only make a decision balancing initial cost against energy efficiency and future operating costs. Moreover, the relevant information to make this evaluation is readily available from the price tag and the energy information posted on the unit. The individual is not seeking bids from multiple potential suppliers for multiple pieces of equipment to design and fabricate the various units that would be part of an integrated chemical processing facility, like the proposed plant.**

the kilns, expressed in terms of CO_2 and CO_2, has been included in the permit.

With regard to purchase of CO_2 offsets, given that CO_2 is not et the subject a comprehensive federal program, it would not be appropriate to impose a requirement on the proposed plant whose principal justification would be to control emissions of CO_2. In addition, requiring CO_2 offsets would be contrary to the "rule-of-law." The mechanisms and institutions that might be used to obtain CO_2 offsets are in their infancy. It is also only possible to speculate on the cost of such offsets over time, particularly as control programs are adopted for CO_2 emissions that could compete for such offsets. Lastly, if CO_2 offsets are required of the proposed plant, considerations of equity under the rule of law would argue that existing sources with similar levels of CO_2 emissions should also be required to provide CO_2 offsets to mitigate the effects of their emissions. However, this cannot occur without regulatory adoption of a control program for CO_2 emissions.[92]

The "combination" of the options suggested by this comment would not avoid the difficulties posed by the individual options, and could act to compound them. As such, combinations of options also cannot be justified.

94. Under Section 165(a)(2) of the Clean Air Act, the Illinois EPA must consider the "no-build" option, where the permit would be denied based on considerations related to emissions of CO_2 and other pollutants.

In response to this comment, which succinctly observes that one alternative to the proposed plant is not building a plant at all, the Illinois EPA has considered the "no-build" option. The Illinois EPA can readily respond to and reject this alternative. The potential benefits for Illinois from the plant would be blocked if the permit were denied, as it would effectively block further effort to develop the plant. If the plant is built, it would support the economy of Prairie du Rocher, Randolph County and Illinois generally, as it would provide jobs, purchase equipment and services, and pay taxes. The plant would produce lime, adding to Illinois' local supply of this useful commodity. It would produce this lime from Illinois limestone, taking advantage of a mineral resource in the state. Reliable and affordable supplies of lime are important to the economic well-being of a variety of industries and utilities. As a practical matter, it also should be assumed that the proposed kilns would only operate to the extent that there is actually be a market or demand for the lime produced by the plant.

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[92] **The Illinois Public Utilities Act may also be relevant as it provides a statement of the State of Illinois' policy with respect to requirements for CO_2 offsets. That is, these measures should be encouraged by the State of Illinois but should not be mandated at this time. This is a sound approach to the proposed plant until a regulatory program is appropriately adopted that would address the plant's CO_2 emissions as well as the CO_2 emissions of other similar plants.**

As related to its environmental impacts, the proposed plant must be constructed and operated to comply with all applicable environmental regulations. This would include any changes to the operation of the plant as needed to comply with future laws and rules that are adopted that address emissions of CO_2 and other GHG. Finally, while blocking the continued development of the proposed plant would "eliminate" its potential GHG emissions, it would do nothing to reduce actual GHG emissions from existing lime kilns that currently supply the market for lime.

95. The Illinois EPA cannot issue this permit without requiring mitigation of the emissions of GHG because it would allow the proposed plant to emit CO_2, N_2O and other GHG in such quantities that would cause or tend to cause air pollution. This would be contrary to 35 IAC 201.141, which provides that "[N]o person shall cause or threaten or allow the discharge or emission of any contaminant into the environment in any State so as, either alone or in combination with other sources, to cause or tend to cause air pollution in Illinois."

This comment does not show that a permit should not be issued for the proposed plant without mitigating its GHG emissions. The proposition put forth in this comment is flawed in several respects. First, the statutory framework for "air pollution," as cited by the comment, is geared towards enforcement, not regulation.[93] The language of both the statute and regulation is that of prohibition, whose redress would normally be found in an injunction or other equitable remedy before a court. It is not language that creates enabling authority through which the Illinois EPA could lawfully seek to "mitigate" or regulate the impacts of CO_2 emissions during permitting. Moreover, the concept of a statutory prohibition does not lend itself to partial restraints. That is, the offending conduct is to be prohibited, not mitigated or sanctioned. Given the absence of any technology to completely eliminate CO_2 emissions from lime kilns, it is not clear how the remaining amounts of CO_2 that this comment would allow from the plant could be judged any less harmful or offending to society if, as alleged, CO_2 emissions are broadly deemed a form of "air pollution." Finally, to the extent that this comment would have the Illinois EPA itself constrained through such a prohibition, the premise is also misplaced. State courts have rejected the notion that the Illinois EPA is subject to

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[93] **"Air pollution" is defined by Illinois law, in Section 3.115 of Illinois' Environmental Protection Act, is the "presence in the atmosphere of one or more contaminants in sufficient quantities and of such characteristics and duration as to be injurious to human health, plant, or animal life, to health, or to property, or to unreasonably interfere with the enjoyment of life or property." As with nuisance law, the statutory definition contemplates an activity that creates such injury or unreasonable consequences that the law will presume damage and provide redress. Notably, the statute refers to the definition in the general air pollution prohibition that is found in Section 9(a) of the Act. The definition of air pollution adopted by the Pollution Control Board at 35 IAC 201.102 , which this commenter cites, is nearly identical.**

enforcement when acting in its established role as a permitting authority.

The argument advanced by the comment also fails to satisfy principles of "fundamental proof." A complainant seeking to enforce a right conferred by statute is generally required to prove both causation and injury. In the scientific community, as well as among public policy-makers, the notion of cause and effect is relative. However, in a courtroom, causation takes on a rigorous meaning, that is both highly demanding and structured. Generally speaking, factual causation is shown when a reasonable certainty exists that the alleged conduct caused an injury. Mere conjecture or speculation of causation is not enough. Similarly, the alleged injury must be amenable to proof, not merely contingent, remote or prospective. A speculative possibility of an injury does not satisfy this element. Given the difficulties in assessing the extent of global warming, not to mention assigning responsibility for harm to individual sources of CO_2 emission, the enforcement approach to regulating CO_2 emissions recommended by the commenter is clearly ill-advised.

Finally, treating CO_2 emissions as a regulated air pollutant under Illinois law would be wholly unconventional. CO_2 is a compound that is present in the earth's atmosphere, occurring both naturally and as a product of fossil fuel combustion. CO_2 in the atmosphere has not been commonly regarded as an air "pollutant." Indeed, the ecosphere depends upon the presence of CO_2 emissions to support green plants. Historically, CO_2 in the ambient atmosphere has not been considered harmful to humans or the environment. While the statutory definition of air contaminant in Section 3.165 of the Environmental Protection Act is broad, citing to "any solid, liquid, or gaseous matter… or form of energy, from whatever source…" and CO_2 would seem to fall within the meaning of the term, it should not be presumed that courts would conclude that CO2 emitted by any given source would constitute air pollution. Courts are reluctant to construe language literally when it would defeat the purpose or intent of the law, leading to an outcome that was not contemplated by the legislature.[94]

96. The GHG emissions from the proposed plant will cause air pollution as defined by Illinois' rule.[95] Accordingly, because 35 IAC 201.141 is part of Illinois' State Implementation Plan (SIP), Section 165(a)(3)(C) of the Clean Air Act provide that a PSD permit cannot be issued for the plant unless and until Vulcan

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[94] Interestingly, Professor Currie, widely known as the principal draftsman of Illinois' Environmental Protection Act, expressed concerns about reading too much into certain elements of the definition of air pollution. In a 1976 law review article, Professor Currie remarked: "To seize upon broad definitional language of modest purpose to expand state regulation into areas not traditionally thought of as pollution smacks too much of invading the province of the legislature." See Enforcement Under the Illinois Pollution Law, Northwestern University Law Review, Vol. 70, No. 3 (July-August 1976).

[95] As defined by 35 IAC 201.102, air pollution means "the presence in the atmosphere of one or more air contaminants in sufficient quantities and of such characteristics and duration as to be injurious to human, plant or animal life, to health, or to property, or to unreasonably interfere with the enjoyment of life or property."

demonstrates that emissions from the plant will not cause or contribute to air pollution in violation of 35 IAC 201.141.

The nature and effect of 35 IAC 201.141, as discussed above, is not changed by the fact that this state rule is part of Illinois' SIP. At a minimum, this is because 35 IAC 201.141 is neither an applicable emission standard nor a standard of performance for purposes of the Clean Air Act, as are specifically addressed by Section 165(a)(3)(C) of the Act.

97. The lime industry proposed steps to reduce its GHG emissions more than seven years ago.

This voluntary action by the lime industry is not relevant to the current status of GHG under the Clean Air Act.

COMMENTS ON SPECIFIC PERMIT CONDITIONS

A. The note in the draft permit following Finding 3(c), which states that greenhouse gases (GHG) are not yet a regulated pollutant for purposes of PSD, is incorrect. GHG are subject to the PSD rules under the Clean Air Act. The USEPA has determined, GHG will be subject to PSD rules no later than January 3, 2011. (I contend that GHG have been subject to regulation for some time already). Since the final permit decision for the proposed plant will not be made before January 3, 2011, the Illinois EPA must conduct a BACT analysis and other impact analyses for emissions of GHG and set BACT limits for emissions of GHG.

This comment confirms that for the purposes of this permit, GHG are not a regulated pollutant under the PSD program. As acknowledged in this comment, USEPA has determined that GHG will become a regulated pollutant for purposes of the PSD rules on January 3, 2011, which will be after the Illinois EPA made its final determination on this application. As a delegated authority of the USEPA, the Illinois EPA must act in accordance with USEPA's determinations with respect to GHG, which were made through rulemaking, rather than the various contentions of this commenter. Accordingly, the permitting of the plant does not necessitate impact analyses and BACT limits for GHG.

The Illinois EPA has indirectly addressed emissions of GHG in the permit, as Condition 2.1.3-2 sets performance standards for the preheaters on the kilns, expressed in terms of CO_2 and CO_2 equivalents (CO_{2e}). In this regard, the proposed plant must be developed to minimize emissions of GHGs as it includes features to enhance fuel and energy efficiency of the kilns, notably the preheaters on the kilns. If PSD were applicable to the proposed plant for its emissions of GHGs, these preheaters on the kilns would be the primary control technology specified as BACT for the plant's emissions of GHGs, which are primarily CO_2.

For this permit, the preheaters on the kilns will be a secondary control technology for emissions of pollutants that are subject to PSD as they reduce fuel consumption and accordingly act to reduce emissions of NOx and CO, which are linked with combustion of fuel in the lime kilns. Because the preheaters serve to reduce emissions of NOx and CO, the permit would set design standards for the energy efficiency of the kilns with preheaters, expressed indirectly in terms of emissions of GHGs and CO2 per ton of lime product from the kilns, on an annual average basis. These standards serve to indirectly address the GHG emissions of the plant.

B. The note in the draft permit following Finding 3(c) also appears to be inconsistent with Condition 2.1.3-2(a)(i), which sets the design requirements for the preheaters on the kilns. While the Illinois EPA is clear that those requirements are not intended to represent BACT, the permit clearly limits emissions of CO_2, thus regulating emissions of CO_2, so as to also require BACT limits for CO_2.

The establishment of certain requirements in this permit that are expressed in terms of CO_2 and CO_{2e} does not constitute "regulation" of these pollutants so as to trigger full applicability of PSD. As discussed in the Project Summary, the preheaters on the kilns would be a secondary control technology for emissions of pollutants that are subject to PSD as the preheaters reduce fuel consumption and thus act to reduce emissions of NOx and CO, which are linked with combustion of fuel in the kilns. Because the preheaters serve to reduce emissions of NOx and CO, the permit would set design standards for the energy efficiency of the kilns with preheaters, expressed indirectly in terms of emissions of GHGs and CO_2 per ton of lime product from the kilns. The fact that energy efficiency happens to be addressed in terms of pollutants that will be regulated in the future does not mean that the Illinois EPA is acknowledging that these pollutants are currently regulated.

C. The "periodic monitoring" or compliance procedures in the draft permit that would accompany Condition 1.3(b), which addresses Illinois' standard of general applicability for opacity, 35 IAC 212.123(a), would not be adequate. Observations of opacity by Method 9 are only conducted infrequently and cannot be conducted at night or when weather or light conditions are not appropriate. The permit must ensure continuous compliance and should provide adequate compliance procedures for all periods of operation, including nighttime operation. For example, since continuous opacity monitors are required on the kilns, the permit should provide that those monitoring systems can be used to address the opacity limit of 35 IAC 212.123(a).

The limitations or constraints on opacity observations, as generally addressed by this comment, do not demonstrate that the compliance procedures in the permit that accompany limits for opacity, including the limit in 35 IAC 212.123(a), would be

inadequate. Those constraints are an inherent aspect of limits and standards for opacity. In particular, it is recognized that as light and weather conditions during certain periods are unsuitable for opacity observations, opacity observation must be conducted at other times when conditions are suitable. However, the operation of emission units under suitable observation conditions can be compared to their operation at those other times so that the opacity observations also address periods when observations cannot be conducted. In addition, it should be recognized that limits and standards for opacity can be readily implemented. As compared to performance tests for emissions or extrapolation from process parameters, compliance with an opacity limit can be directly and immediately determined by an observer who is qualified to make such observations. The ease of implementation of opacity limits is presumably why limits and standards for opacity continue to be adopted. Opacity standards continue to play a vital part in regulation of emissions, as illustrated by USEPA's adoption the NESHAP for Lime Manufacturing that set limits for the opacity of both stack and fugitive emissions of subject emission units.

In addition, for the kilns, for which continuous opacity monitoring would be conducted, the permit need not specify that those systems shall be used to determine compliance with 35 IAC 212.123(a). The general principle of "credible evidence" in Illinois provides that the data collected by such systems could be used if needed to address compliance with 35 IAC 212.123(a). In this regard, however, the kilns are subject to a more stringent opacity limit pursuant to the NSPS,[96] with compliance with that limit to be addressed by the required continuous opacity monitoring systems.

D. Condition 1.3(b) in the draft permit, which addresses 35 IAC 212.123(a), would also be inadequate because it does not include the language from 35 IAC 212.123(b).[97]

It is acceptable for Condition 1.3(b) to merely reference 35 IAC 212.123(b), rather than include the complete text of this rule. As 35 IAC 212.123(b) is a provision of Illinois state rules, it is applicable as a matter of law even if it is not fully restated in the permit. The actual language of the rule is also readily available for those who want to read it.

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[96] **The NSPS, 40 CFR 60.342(a)(2), limits the opacity of emissions from lime kilns to 15 percent. In addition, the NSPS, 40 CFR 60.11(d), requires that the lime kilns including associated air pollution control equipment be maintained and operated at all times, including periods of startup, shutdown, in a manner consistent with good air pollution control practice.**

[97] 35 IAC 212.123(b) provides that emissions with an opacity greater than the generally applicable state limit of 30 percent, but not greater than 60 percent, are allowed from an emission unit in an hour (i.e., a 60 minute period) for a period of up to 8 minutes provided that: 1) In such hour, emissions with opacity greater than 30 percent do not occur from another emission unit at the source that is within 1000 feet of the emission unit; and 2) The opacity of emissions from the emission unit do not exceed 30 percent in more than three hours in any 24-hour period.

As a practical matter, the Illinois EPA has not included the language of 35 IAC 212.123(b) in the permit because restrictions on opacity that are more stringent than the 30 percent limit in 35 IAC 212.123(a), a state standard of general applicability, will apply to and govern the opacity of emissions of the emission units at the proposed plant. As 35 IAC 212.123(b) provides a narrow exception to the general opacity standard in 35 IAC 212.123(a), which exception is subject to various constraints, it is reasonable to only reference 35 IAC 212.123(b) in the permit.

E. The permit should also clarify in Condition 1.3(b) that the plant does not quality for 35 IAC 212.124(d) because the plant is subject to limits pursuant to Sections 111 and 112 of the Clean Air Act.

The permit need not make the clarification requested by this comment. As emission units at the proposed plant are subject to NSPS or NESHAP standards pursuant to Sections 111 and 112 of the Clean Air Act, it should be readily apparent that those units are not covered by the provisions of 35 IAC 212.124(d).[98]

F. In Condition 1.3(b), the phrase "except as allowed by 35 IAC 212.123(b) and 212.124" indicates that opacity can exceed 30 percent when certain conditions set forth in 35 IAC 212.123(b) or 212.124 are met. However, the draft permit would not require compliance procedures for the facts that would be necessary to determine whether those conditions are met. It also would not include definitions of the terms "startup" and "malfunction and breakdown," as needed to implement 35 IAC 212.124(a).

The permit does not need to require recordkeeping and other measures to support the exceptions and alternatives to 35 IAC 212.123(a) that are present in 35 IAC 212.123(b) and 212.124. As a general matter, in the unlikely event that circumstances arise in which the source seeks to rely on one of these exceptions, the source would have to demonstrate that it is entitled to the exception. If the source cannot demonstrate that it qualifies for an exception, with appropriate supporting data, the exception would not be available. It is not necessary for a permit to speculate on future reliance on the regulatory exceptions to 35 IAC 212.123(a) when the source may never elect to rely on any of those exceptions. In addition, it is not necessary for the permit to develop definitions for the terms "startup" and "malfunction and breakdown," which are used in the exception in 35 IAC 201.124(a). This is because, since the permit does not authorize violation of 35 IAC 201.123 during these periods, the "exception" in 35 IAC 201.124(a) is not applicable and compliance with 35 IAC 201.123 is required at all times.

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[98] **35 IAC 212.124(d) addresses the interaction between Illinois state emission standards for particulate matter and the state standards for opacity. It provides that in certain circumstances compliance with the applicable emission standard for particulate matter constitutes a defense to the applicable state opacity standard.**

G. The permit must have specific compliance procedures to accompany 35 IAC 212.123 and 212.301, as addressed in Conditions 1.3(c), 2.2.3-4(a) and 2.4.3-3 of the draft permit, to ensure that these standards are practicably enforceable. The permit, as drafted and lacking that specificity, is insufficient. See McEvoy v. IEI Barge Services, 622 F. 3d 671, 679 (7th Cir. 2010). The permit must provide the clarity required by the Seventh Circuit regarding how compliance with these standards should be determined in order for them to be enforceable.

The permit appropriately addresses 35 IAC 212.123 and 212.301. As related to 35 IAC 212.123, compliance procedures required by the permit include elements that are related to opacity of emissions, which would be applicable or relevant to verification of compliance with this standard. These include specific requirements for observations of opacity (Conditions 2.2.7-1, 2.2.7-2, 2.3.7-1 and 2.3.7-2), periodic inspections of emission units to verify proper operation of control measures (Conditions 2.2.8 and 2.3.8), and related recordkeeping (Conditions 2.2.9, 2.3.9 and 3.3). The comment does not identify specific inadequacies in these requirements or suggest specific changes to these requirements. This comment does not explain how the cited decision of the 7th Circuit Court of Appeals is relevant to this permit nor is this apparent on its face. For example, that decision did not even address 35 IAC 212.123 nor did it address the appropriate content of construction permits.[99]

35 IAC 212.301 is appropriately addressed by the permit, as this standard may be readily implemented.[100] It is a state rule of general applicability that addresses visibility of emissions of fugitive particulate off of plant property. As such, it is expected that a possible violation of 35 IAC 212.301 would only become relevant for an emission unit if other applicable standards or limits for fugitive emissions were already violated. In such case, the violation would be more effectively dealt with directly relative to those requirements, rather than engaging in observations off of plant property in an attempt to evaluate the nature of visible emissions from the responsible unit at the point where the emissions cross the property line. Notwithstanding, as 35 IAC 212.301 is applicable to the proposed plant, as it is to

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[99] **This decision also did not affect the validity or applicability of either regulation but, rather simply, passed judgment upon the enforceability of certain rules, brought in a private action, through the venue of a citizen suit under the Clean Air Act**

[100] **35 IAC 212.301 prohibits fugitive emissions of particulate matter from any process at a source that are visible by an observer who is not on a source's property when looking toward the zenith, i.e., directly overhead. Formal training and certification, as specified by USEPA Method 9 for observations of opacity, are not needed to determine compliance with this requirement. The only requisites for such determinations are that the observer not be on the property of the source from which emissions originate. The observer must also be looking directly overhead, as if lying on the ground, rather looking transversely over the surface of the earth. Obviously, while the identification of visible emissions would occur instantaneously, the duration of observed visible emissions and the frequency of observed visible emissions could be factors that would be relevant in enforcing this standard.**

most sources in Illinois, this standard is identified in the permit.

H. This condition must be revised to ensure that the Illinois EPA may only supplement the requirements for recordkeeping and reporting established in the permit to make them more stringent. Conditions created in a Title I permit, such as a PSD permit, cannot be removed or made less stringent through the Clean Air Act Permit Program (CAAPP) permit issued for operation of the plant, as that permit would be subject to Title V of the Clean Air Act.

In response to this comment, Condition 1.10 has not been carried over to the issued permit.[101] While the Illinois EPA does not agree with the comment, it is not necessary for this permit to address future actions that might occur during the processing of CAAPP permits for the plant.

I. Condition 2.1.3-3(a) in the draft permit, which addresses the federal NESHAP for Lime Manufacturing, should specify which requirements in 40 CFR 63, Subpart AAAAA "and related provisions in 40 CFR 63, Subpart A, General Provisions" apply. This is especially important because the Illinois EPA includes one such requirement in Condition 2.1.3-3(a)(ii), which could be misinterpreted to mean that only that provision applies. In fact, numerous additional requirements apply that the Illinois EPA has not identified. For example, the visible emission standards in 40 CFR 63 Subpart AAAAA are not included in the permit.

Condition 2.1.3-3(a) of the permit appropriately addresses the applicability of this NESHAP, as it specifically addresses the NESHAP as it applies to the kilns. In this regard, Condition 2.1.3-3(a)(ii) repeats the relevant emission standard of this NESHAP that applies to the kilns, i.e., 0.10 pounds of particulate matter per ton of stone feed. This NESHAP does not set a standard

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[101] The proposition made in this comment is unsupported and is also contrary to other comments made by this commenter. This commenter has expressed various concerns about the adequacy of the compliance procedures in the permit, which would include the provisions for recordkeeping and reporting. Notwithstanding the legal requirements for the nature or extent of such compliance procedures in this construction permit, such procedures or "periodic monitoring" will be required in the operating permit for the proposed plant, as that permit will be a CAAPP permit. As such it is to be expected that the CAAPP permit could act to strengthen or enhance the compliance procedures set in this permit. However, this also means that certain records and reports required by this permit could become obsolete and unnecessary. For example, monitors for additional metrics could become available and be installed and records could be required for different operating parameters or data to more effectively address compliance. In such circumstances, it should be expected that the relevant recordkeeping and reporting requirements in this permit would be revised or replaced by new requirements of the CAAPP permit. Accordingly, Condition 1.10 was included in the draft permit to generally "warn" the source and others that the recordkeeping and reporting requirements set in this permit would be subject to review and possible change during the periodic processing of CAAPP permits for the plant. In this light, it is not appropriate for Condition 1.10 to be revised as suggested by this comment, as it would presume upon the nature of the changes to recordkeeping and reporting requirements that might occur during the processing of CAAPP permits for the plant. However, Condition 1.10 also does not need to be carried over to the issued permit.

for visible emissions or opacity for lime kilns. As the permit does not repeat at length other provisions of this NESHAP, which address subjects such as compliance reporting, emissions testing, operational monitoring and periodic reporting, the permit is clear that the actual provisions of the NESHAP govern, which they do in any case, and that they should be referred to. Indeed, the drafting of the permit acts to avoid misinterpretation since it does not suggest that the permit should be relied upon as a substitute for the actual regulatory language for the various requirements that accompany the emission standards set by this NESHAP.

J. Condition 2.1.3-3(b)(ii) in the draft permit, which addresses the NSPS for Lime Manufacturing, should be revised to read "the particulate matter emissions of the affected kilns,… shall each not exceed 15 percent opacity **or** and 0.30 kilograms per megagram…" Otherwise, the condition could be misinterpreted to mean that a violation of the NSPS standards would only occur for a kiln when there is an exceedance of both the opacity limit and the mass limit, in kilograms per megagram. In fact, a violation would occur whenever the opacity limit would be exceeded.

The change to the permit requested in this comment is not appropriate. In fact, the requested change would act in a manner contrary to the concern expressed in the comment. The recommended language would indicate that compliance with either the opacity limit or the mass limit of the NSPS is all that is required. As is commonly understood, and is as reflected in the discussion in the comment, the kilns must comply with both limits of the NSPS.

K. As related to Condition 2.1.3-3(b)(ii) in the draft permit, which addresses the NSPS standards applying to the kiln, the draft permit would not require sufficient recordkeeping to determine when and if startup, shutdown or malfunction are occurring. The condition purports to exempt those periods, but the permit contains no recordkeeping for the Illinois EPA, USEPA or the public to know whether excess emissions claimed to occur during startup, shutdown or malfunction truly occurred during one of those periods. The permit should require detailed recordkeeping as related to startup, shutdown and malfunction.[102]

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[102] As a startup is generally defined by 40 CFR 60.2 as the setting in operation of an emission unit for any purpose, recordkeeping sufficient to determine if excess emissions are caused by startup would include, at a minimum: (1) The first action that begins the process of setting a unit in operation; (2) The last moment when the unit is being set in operation and after which the process is "in operation;" and (3) The beginning and ending period of time for startup.

As shutdown is defined by 40 CFR 60.2 as the cessation of operation of an emission unit for any purpose, recordkeeping sufficient to determine if excess emissions are caused by shutdown would include, at a minimum: (1) The first action that begins the process of ceasing operation of a unit; (2) The last moment when the cessation of operation ends; and (3) The beginning and ending period of time for each shutdown.

As a malfunction is generally defined by 40 CFR 60.2 as any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner and does not include failures that are caused in part by poor maintenance or careless operation, recordkeeping to determine whether excess emissions are attributable to malfunction

The permit appropriately addresses the relevant provisions of the NSPS dealing with startup, shutdown and malfunction of the kilns. In this regard, 40 CFR 60.8(c)[103] provides that NSPS standards generally do not apply during these periods.[104] However, this exemption is constrained by the specific definition of the term "malfunction" in 40 CFR 60.2 and the requirements that good air pollution control practice be used at all times for the kilns. In addition, for purposes of recordkeeping and reporting, the NSPS would treat exceedances of NSPS standards during such periods as if they were violations. This provision of the NSPS is a conditional one and does not provide a "blanket exemption" from otherwise applicable standards. As such, it is not necessary for the permit to be developed to specifically facilitate reliance on this exemption by the source. If a kiln exceeds an applicable NSPS standard during one of these periods and the source cannot demonstrate that it qualifies for the regulatory exemption, with appropriate supporting data, the exceedance could be pursued as a violation of the NSPS standard.

Moreover, the NSPS, 40 CFR 60.7(b), requires certain records be kept for such periods, as generally addressed in Condition 2.19(a)(i) of the permit. The permit also requires other detailed records to be kept for the kilns related to these periods (Conditions 2.1.9(c) and 3.3(b).) This comment does not explain why this recordkeeping would be insufficient or propose specific changes to these requirements.

L. The permit should require operational monitoring for lime output from the kiln. The BACT limits are set in terms of pounds of emissions per ton of lime. However, Condition 2.1.8-3(a) would only require monitoring for the amount of limestone entering the kiln.

Monitoring limestone input to the kilns is more practical than monitoring lime production. It is both easier and more reliable to measure stone feed to a kiln at a single point on feed belt to the kiln when the material is at ambient temperature. In conjunction with the yield ratio of the kilns, ton of lime produced per ton of limestone feed, the monitored data for limestone input to the kilns will provide for implementation of

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must, at a minimum, must allow determination of: (1) The cause of the malfunction event (including whether due to failure of air pollution control equipment, process equipment, or a process); (2) The frequency of the specific malfunction event; (3) What steps are taken to prevent the specific malfunction event; (4) Whether all possible maintenance and operational steps were taken to prevent the specific malfunction event.

[103] **During those periods, emissions and operation of subject units are addressed by 40 CFR 60.11(d), which provides that "At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions."**

[104] **NSPS emission standards only apply during startup, shutdown and malfunction as specifically provided in particular subparts of the NSPS. The NSPS for Lime Manufacturing, 40 CFR 60, Subpart HH, does not provide that its standards apply during such periods.**

BACT limits expressed in terms of lime output from the kiln. In response to this comment, the issued permit also requires the source to keep records for the yield ratios of the kilns. (See Condition 2.1.9(d)(iv).)

M. Condition 2.2.3-2(b) must specify which emission units are subject to these requirements. The phrase "other affected units that are not subject to the NSPS or NESHAP shall comply" is too vague to be practicably enforceable. The Illinois EPA must, at a minimum, identify which units are affected by a NSPS and by a NESHAP standard and, consequently, which are covered by the limits in Condition 2.2.3-2(b).

The wording of this condition is appropriate when considered in context. The combination of Condition 2.2.3-2(a) and (b) act to impose identical BACT limits on all the limestone and fuel handling operations at the plant, as addressed by Section 2.2 of the permit. For operations that are subject to NESHAP or NSPS standards, as addressed in Condition 2.2.3-2(a), this reflects a determination that those standards directly represent BACT. For emissions units that are not subject to these standards by rule, this reflects a determination those standards also represent BACT.

N. There is no apparent basis in the Project Summary for the limits in Condition 2.2.3-2(b). It is not clear what the statutory basis is for these limits. Nor, to the extent they are intended to be BACT, MACT or another case-by-case limit, is there any basis in the record for the Illinois EPA's development of these limits. The Illinois EPA must provide the regulatory basis as well as the analysis behind these limits and allow for new public comment opportunity. Moreover, if these are intended to be limits for pollutants other than (or in addition to) PM, for example as using PM as a surrogate, the Illinois EPA has provided no for surrogacy.

While the Project Summary prepared by the Illinois EPA to accompany the draft permit for the proposed plant focused on the kilns (since they would be the principal emission units at the plant), the basis for requirements for other emission units at the plant is straightforward. As those units emit particulate, those units are subject to Best Available Control Technology (BACT) because the plant would be major and have the potential to emit significant amounts of PM, PM_{10} and $PM_{2.5}$. The determinations of BACT for various emission units at the plant are made in the conditions of the permit with the heading "Control Technology Determination," including Condition 2.2.3-2. (This is explained in Finding 4(a) of the permit.) For emission units that are not subject to a NESHAP standard adopted by USEPA, such as handling of solid fuel, the BACT determination also serves as the case-by-case determination of Maximum Achievable Control Technology (MACT) pursuant to Section 112(g) of the Clean Air Act. (This is explained in Finding 3(d) of the permit.[105])

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[105] **This reflects a conservative approach to the permitting of the plant, treating the lime plant as a new and separate source from the existing limestone mine and rock**

The BACT determinations for both limestone and solid fuel material operations reflects a finding that the relevant control requirements in the NESHAP for Lime Manufacturing (40 CFR 63, Subpart AAAAA) and the NSPS for Nonmetallic Mineral Processing (40 CFR 60 Subpart OOO) represent emission limits that are achievable for material handling operations. (The standards or emission limits in these rules are identical.) In particular, USEPA recently completed a periodic update to 40 CFR 60 Subpart OOO (74 FR 19309, April 28, 2009). The standards in these rules, along with underlying control practices, are equally applicable to all limestone handling operations at the plant and to solid fuel handling operations at the plant, which are not directly subject to these rules. This determination of BACT builds upon the BACT demonstration for material handling in the application for the proposed plant (Pages 32 through 40 of the submittal dated October 23, 2008). It also reflects the Illinois EPA's experience with material handling operations. As this determination of BACT also serves as a determination of MACT for certain units, it reflects the actions of USEPA in adopting NESHAP standards, including 40 CFR 63 Subpart AAAAA. For materials that are not considered hazardous in their bulk form, such as limestone, standards for particulate matter are used to address the trace levels of constituents that are hazardous air pollutants in the materials.

O. There is no monitoring frequency required nor an identification of even which emission units must be monitored to ensure compliance with the limits in Condition 2.2.3-2(b) for limestone and fuel handling operations.

As all emission units addressed by Section 2 of the permit, i.e. limestone and fuel handling operations, are subject to the same control requirements or limits for emissions, either as they are subject to those limits by rule or as those limits are imposed by the permit. It is not necessary for Condition 2.2.3-2(b) to set a "monitoring frequency" for these limits, as they would be applicable at all times. Appropriate compliance procedures accompany these limits, including requirements for opacity observations (Conditions 2.2.7-1 and 2.2.7-2), requirements for operational inspections (Condition 2.2.8), and recordkeeping requirements (Conditions 2.2.9 and 3.4). The required records include records to generally confirm normal operation of emission units and detailed records for periods of abnormal operation, including the potential for any excess emissions from the unit. The issued permit also includes a new condition, Condition 2.2.7-3, that addresses emission testing for these operations, as would be relevant for add-on filters installed on these operations.

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crushing facility. If the proposed lime plant were approached as a modification of the existing source, which consists of a limestone mine and rock crushing facility, a case-by-case determination of MACT would not have been needed, as none of the emissions units are not directly subject to NESHAP standards are "process or production units" that would be major source for emissions of hazardous air pollutants when considered by themselves.

P. Conditions 2.2.3-3(a) and (b) must specify which emission units at the plant must comply with which NESHAP and NSPS limits. The conditions are too vague to be practicably enforceable. By merely asserting that "certain affected units" are covered and giving a vague list of examples ("i.e., crushers, grinding mills, screening operations…"), the permit would not ensure that each affected unit is required to comply with each applicable limit, nor that the associated compliance procedures would be required for each unit.

The additional clarification to the permit requested by the comment to Condition 2.2.3-3(a), which addresses applicability of the NESHAP, 40 CFR 63 Subpart AAAAA, to "processed stone handling (PSH) operations" at the plant, is not needed. The permit does not "merely assert" that some limestone handling emission units are subject to the NESHAP. The parenthetical phrase in Condition 2.2.3-3(a), which is referred to in this comment, specifically delineates the emission units that are subject to the NESHAP. This phrase reflects the relevant language of this NESHAP, 40 CFR 63.7082(g), which delineates applicability of this NESHAP to PSH operations. Moreover, this NESHAP would apply as a matter of law to subject units, even if the language of the NESHAP is not restated in the permit. The text of the actual rule is also readily available.

The additional clarification to the permit requested by the comment is also not needed to Condition 2.2.3-3(b), which addresses applicability of the NSPS, 40 CFR 60 Subpart OOO to limestone handling operations at the source. The parenthetical phrase in Condition 2.2.3-3(b), delineates the emission units that are subject to the NSPS. In particular, the phrase reflects the relevant language of this NSPS at 40 CFR 60.670(a) and (e). This NSPS would be applicable to subject operations even if was not addressed in the permit.

Q. 35 IAC 212.321, as addressed by Condition 2.2.3-4(b) in the draft permit, should be accompanied by compliance procedures that are sufficient to ensure continuous compliance for all periods of operation. The draft permit would not include such procedures. The provisions for opacity observations in Conditions 2.2.7-1 and 2.2.7-2 would not be adequate for this purpose.[106]

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[106] The initial, "one-time" opacity observations required Condition 2.2.7-1 would be insufficient. First, they occurs only once unless the Illinois EPA makes a written request. This is insufficient to determine compliance with continuous emissions during all hours of operation, and all operating conditions, for the life of the plant. Second, there is no correlation in the record (or anywhere else) between opacity from any of the emission units and mass emissions of any pollutant. Therefore, there is no basis to determine compliance with anything other than an opacity limit by measuring opacity. This does not mean that no correlation is possible – only that the Illinois EPA has not made any correlation in the record.

Similarly, the once-per month observations required by Condition 2.2.7-2 would also be deficient. First, there is no basis in the record (nor is it possible to provide such a basis) for a conclusion that a once per month observation would be representative of all hours of operation, and all operating conditions. Second, again, there is no correlation in the record between opacity from these sources and a mass emission rate.

The compliance procedures in the permit to address 35 IAC 212.321 are adequate. This is because the lowest allowable emission rate for particulate matter set by 35 IAC 212.321 for an emission unit or group of similar units ducted to a common control system is 0.55 pounds per hour.[107] The emissions addressed by Section 2.2 of the permit are subject to more stringent limits on emissions of particulate matter pursuant to Condition 2.2.6(a) of the permit. As such, compliance with the limits in Condition 2.2.6(a) assures compliance with 35 IAC 212.321. With respect to compliance procedures, as already discussed, the opacity observations required by Conditions 2.2.7-1 and 2.2.7-2 are only some of the elements of the compliance procedures for the emission units addressed by Section 2.2 of the permit.

R. The draft permit would apparently not set compliance procedures for the emission limits in Condition 2.2.6(a) for limestone and fuel handling operations. These limits must be accompanied by adequate compliance procedures to ensure that each limit is complied with during each hour. This is needed not only to ensure practicable enforceability but to ensure that the air quality analysis reflects the true worst case conditions. Limits without compliance procedures or with insufficient procedures cannot ensure that the limits are representative and, therefore, that the analysis is representative of the source's operations. To the extent that the opacity observations required by Conditions 2.2.7-1 and 2.2.7-2 are intended to provide the compliance procedures for the limits in Condition 2.2.6(a), those procedures are insufficient for the reasons set forth above.

As already discussed, the emission units addressed by Section 2.2 of the permit would be subject to extensive compliance procedures. These procedures would address compliance with the emission limits set by Condition 2.2.6(a). The opacity observation required by Conditions 2.2.7-1 and 2.2.7-2 are only one element of those compliance procedures and would be relevant as they provide data for the opacity of emissions from subject units, if any, during normal operation of the units and associated control measures.

S. Conditions 2.2.11 and 2.3.11 in the draft permit are unlawful and must not be carried over to a permit. The Illinois EPA must review the specific facility being proposed, and the public must be given the opportunity to review and comment on that facility. A blanket condition providing that the Permittee may construct something other than what was specifically proposed, specifically reviewed by the Illinois EPA, and specifically reviewed and commented on by the public circumvents the permitting process. The Illinois EPA has provided no legal basis for this provision. In fact, this provision violates the Clean Air Act and 40 CFR 52.21.

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[107] **Given the amount of material handled by the subject emission units, 35 IAC 212.321 would set an allowable emission rate for particulate matter that is much greater than the minimum 0.55 pounds per hour allowed. For example, for a nominal process weight of 1 ton per hour, 35 IAC 212.321 would set an allowable emission rate of 2.6 pounds per hour, which is greater than the total hourly emissions allowed from the subject unit by Condition 2.2.6(a).**

The Illinois EPA has reviewed the specific "facility" or plant that is proposed and determined that it is entitled to a permit. Condition 2.2.11 and 2.3.11 would potentially authorize certain carefully circumscribed changes in the material handling operations at this plant, subject to the supervision of the Illinois EPA. In particular, these conditions require that the changes to these operations act to improve dispersion and reduce impacts, that the Illinois EPA be notified in advance of such changes, and that the source perform additional dispersion modeling if requested by the Illinois EPA.

This comment does not show that Conditions 2.2.11 and 2.3.11 would be improper. The comment merely makes a superficial claim that the PSD permit program cannot accommodate any changes to a permitted facility or source during the detailed design and construction of the source.

T. The Project Summary does not identify the statutory or legal basis for the limits for the emission units addressed by Conditions 2.3.3-2 and 2.3.6 of the draft permit. To the extent these limits are intended to be BACT or MACT, there is not any basis in the record for the Illinois EPA's development of these limits. The Illinois EPA must provide the basis as well as the analysis behind these limits and allow opportunity for public comment. Moreover, if these are intended to be limits for pollutants other than (or in addition to) PM – for example as using particulate as a surrogate – the Illinois EPA has provided no for surrogacy. There is also no monitoring frequency required nor an identification of even which emission units must be monitored to ensure compliance with these limits. The only general monitoring requirements are too vague, and too infrequent to know whether and when monitoring is required and how it is to be conducted. Moreover, there is no basis in the permit for any finding (to the extent the Illinois EPA intended to make one) that generally "conduct[ing] opacity observations" is sufficient to ensure continuous compliance with the limits, or that it can determine those emissions on an hourly or annual basis.

The legal circumstances of Conditions 2.3.3-2 and 2.3.6 in the draft permit are generally similar to those of the parallel conditions in Section 2.2 of the permit. The lime handling and processing operations and the kiln dust handling operations that are addressed by Conditions 2.3.3-2 and 2.3.6 are identified in Condition 2.3.2. As explained in the Project Summary, the BACT determination for these operations reflects a finding that the BACT technology for particulate emissions from product conveying, processing and loadout is enclosure and filtration. BACT technology to address potential fugitive particulate emissions from lime loadout is filtration accompanied by partial enclosure and practices to minimize spillage of material. The BACT determination would appropriately establish BACT in terms of readily enforced performance standards. In particular, visible

emissions of fugitive particulate matter are not allowed.[108] This determination of BACT builds upon the BACT demonstration for handling of these materials in the application for the proposed plant (Pages 32 through 40 of the submittal dated October 23, 2008), considering the Illinois EPA's experience with these types of operations. As this determination of BACT is also a determination of MACT, it reflects the actions of USEPA in adopting NESHAP standards, including 40 CFR 63 Subpart AAAAA. For materials that are not considered hazardous air pollutants in their bulk form, such as limestone, standards for particulate matter are used to address the trace levels of constituents that are hazardous air pollutants in the materials.[109] Condition 2.3.6 limits emissions of the subject units to the rates used in the air quality modeling.

The limits in Conditions 2.3.3-2 and 2.3.6 are accompanied by appropriate compliance procedures, including requirements for emission testing and opacity observations (Conditions 2.3.7), requirements for operational inspections (Condition 2.3.8), and recordkeeping (Conditions 2.3.9 and 3.4). These procedures are applicable, as appropriate for the types of unit, to all of the emission units addressed by Section 2.3 of the permit.

U. Condition 2.4.3-2(b) requires the source to implement a fugitive dust control plan. However, that plan is not in the materials that were made available to the public with the draft permit and the public has had no opportunity to review that plan. The Illinois EPA must review and specifically approve the plan, and the public must be given notice and an opportunity to review and comment on the plan as part of the current permitting action. The Illinois EPA must, at a minimum, make the plan available to the public, providing an opportunity for the public to comment on the plan, and approve and specifically incorporate the plan into the permit.

Condition 2.4.3-2 appropriately addresses the fugitive dust control plan that will be required for the plant. This comment does not explain why the fugitive dust control plan for the proposed plant must be prepared and be available to the public at this time, much less when the plant begins to operate. The type of plan that is required is one that cannot reasonably be prepared and, accordingly, should not be prepared until after the design of the proposed plant has been completed and finalized.[110] It is also

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[108] Filters must meet a very stringent performance limit for particulate matter, i.e., 0.0002 gr/scf. This is the level of performance for filters used by Mississippi Lime in its emissions calculations for lime and kiln dust handling operations. The opacity of the emissions from the filters is limited to the opacity standard for stack emissions in the NESHAP for Lime Manufacturing, 7 percent. However, observations for opacity are required if any visible emissions are normally observed from a filter.

[109] Lime kiln dust collected by the baghouses on the kilns is composed primarily of limestone and lime.

[110] As the USEPA's Environmental Appeals Board has recognized in a recent ruling, imposing similar pre-construction plan requirements on a permit applicant prior to actual completion of the source would be problematic and is unwarranted. (Power Holdings of Illinois, LLC, PSD Appeal No. 09-04, slip opinion at page 16 [August 13, 2010].)

only one component of the BACT determination for the roadways and parking areas, which are also subject to a BACT limit for opacity.

As a general matter, it is appropriate that the opacity limit for fugitive dust from roadways be accompanied by a formal program setting out the measures that will be implemented on a day-to-day basis to control dust. The plan must address the various roadways at the plant, not only as they handle different types and numbers of vehicles, but also as the types and numbers of vehicles change in response to production of the plant and other activities at the plant. The plan must be responsive to both weather conditions and events at the plant that affect the rate at which dust or silt is deposited on roadways. The plan must also consider different types of dust control measures as appropriate for different seasons of the year and as new additives become available. As such, it is certainly not appropriate for the source to prepare such a plan with its construction permit application when that plan may have little or no relationship to how fugitive dust will actually have to be controlled to comply with the BACT opacity standard and other permit limits for roadway emissions. Moreover, in the event that such a plan were approved as part of the processing of a construction permit, it would interfere with "mandatory" revisions to the plan by the source upon request by the Illinois EPA, to address deficiencies, as provided for by Condition 2.4.9(b)(iii) of the permit.

V. The Project Summary does not identify the statutory or legal basis for the limits in Condition 2.4.3-2 for roadways and storage piles. To the extent they are intended to be BACT or MACT, the record does not provide the basis for the Illinois EPA's development of these limits. The Illinois EPA must provide further opportunity for public comment on these matters. Moreover, if these are intended to be limits for pollutants other than (or in addition to) particulate matter – for example using particulate matter as a surrogate – the Illinois EPA has provided no basis or record for surrogacy. There is no monitoring frequency required nor an identification of even which emission units must be monitored to ensure compliance with these limits. The only general monitoring requirements are too vague, and too infrequent to know whether and when monitoring is required and how it is to be conducted. Moreover, there is no basis in the permit for any finding (to the extent the Illinois EPA intended to make one) that generally "conduct[ing] opacity observations" is sufficient to ensure continuous compliance with the limits, or that it can determine the mass emission rates set forth (i.e., in pounds per hour and tons per year). There is no basis given for the limits, the monitoring frequency, the monitoring method, or the connection between the monitoring and the underlying limits.

The circumstances of Conditions 2.4.3-2 in the draft permit are similar as a general matter to those of the parallel conditions in Sections 2.2 and 2.3 of the permit.

As explained in the Project Summary, the BACT determination for roadways and storage piles reflects a finding that BACT for emissions of these units is best established accomplished through a stringent standard on the opacity of their emissions and an accompanying requirement for implementation of dust control measures to maintain compliance with that opacity standard. The opacity standard is set at 10 percent, which is a stringent limit for truck traffic at an industrial facility. To provide necessary flexibility in the dust control measures that may be used, as well as to assure that those measures address the final design of proposed plant, those measures are to be codified in a formal fugitive dust control program. This determination of BACT builds upon the BACT demonstration for these operations in the application for the proposed plant (Pages 40 through 43 of the submittal dated October 23, 2008). It also reflects the Illinois EPA's experience with control of fugitive dust from roadways. As this determination of BACT also serves as a determination of MACT for these units, it reflects the actions of USEPA in adopting NESHAP standards, including 40 CFR 63 Subpart AAAAA. For materials that are not considered hazardous in their bulk form, such as limestone, standards for particulate matter are used to address the trace levels of constituents that are hazardous

As explained in response to other comments, the BACT requirements for the subject units are accompanied by extensive compliance procedures.

W. Condition 2.4.3-2(b) of the draft permit would exempt periods when there is snow or ice buildup on roadways and parking areas from dust control requirements, so there would be no emission control during those periods. However, the emission rates used in the air quality modeling assume constant dust control to achieve very high efficiencies. Those control efficiencies cannot be met (if ever) if control measures are not implemented during certain periods.

The exemptions addressed by this comment, which waive implementation of control measures for fugitive dust when there is snow and ice buildup on roadways, recognize that these conditions will act in lieu of implementation of the otherwise required dust control measures. These dust control measures also do not have to be implemented after significant precipitation. Condition 2.4.9(d) of the permit would require detailed records for periods when these exemptions are relied upon as an alternative to implementation of dust control measures. In addition, the opacity standard in Condition 2.4.3-2(a), 10 percent opacity, would continue to apply during these periods.

X. Condition 2.4.5(a) of the draft permit would not be enforceable. Condition 2.4.5(a) of the draft permit would require that the Permittee must follow practices that achieve "very effective and effective control of dust, respectively (nominal 90 percent for paved units and 75 percent control for other units)." As an initial point, there is no regulatory basis given for these requirements. If they are intended to represent BACT, there was no

top down analysis (or equivalent) to identify which control operations were top-ranked and used to determine these levels of control.

These provisions are included in the permit to require the source to implement dust control measures that would provide the levels of emission control for these units that were used in its calculations of the potential emissions of for these units. As this commenter acknowledges in other comment, those emission calculations relied upon certain levels of control efficiency for these units. These requirements are not the BACT determination for these units, which is made in Condition 2.4.3-2 of the permit.

Y. Condition 2.4.5(a) of the draft permit would not be enforceable. There is no basis in the record for any determination that the control efficiencies specified by this condition are achievable, much less on a continual basis. The permit also would not include any measures to address whether the control efficiencies that would be required by Condition 2.4.5(a) are being met, so that the Illinois EPA and others can verify whether these efficiencies are being met. Finally, the control efficiencies that would be required by Condition 2.4.5(a), which reflect the control efficiencies in Appendix C of the application, have no factual basis. There are merely assertions of 90 and 75 percent control, and are applied to emission factors from AP-42, USEPA's *Compilation of Air Pollutant Emission Factors*. Moreover, these emission factors from AP-42 are not appropriate to use to establish site-specific emissions.

As observed by this commenter, the permit for the proposed plant is based on certain levels of control for emissions of fugitive dust, consistent with the level of control of particulate matter emissions from roadways relied upon in the application, which is appropriate. It would not be appropriate for emission calculations for the subject emission units to be based on a lower level of control efficiency than that relied upon by Mississippi Lime. As implied by this comment, achievement of the level of control that has been relied upon in the emission calculations could require that there be "continuous" treatment of plant road under "worst case" conditions for generation of dust emissions. This comment and other comments made by this commenter do not demonstrate that required levels of control efficiency are impossible to obtain, especially with modern vacuum sweepers that filter the collected air stream before discharge.[111]

The permit includes appropriate compliance procedures specifically directed at verification of the control efficiencies that are being achieved for fugitive dust. A key element of these procedures is the records that must be kept for a demonstration of the potential effectiveness of the control program that is being implemented for fugitive dust (Condition 2.4.9(a)(ii)). The permit

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[111] **In this regard, the documents cited by the commenter generally reflect information that is outdated and not applicable to a lime manufacturing plant.**

also includes "work practice" provisions to assure that emissions of the subject units are appropriately controlled to achieve the required control efficiencies, as well as to comply with the emission limits set for roadways in Condition 2.4.6(a). In particular, roadways are subject to requirements for regular treatment and other dust control measure to minimize dust emissions (Condition 2.4.5(a) and (b)).

The compliance procedures that apply to both Condition 2.4.5(a) and 2.4.6(a) to verify the implementation and actual effectiveness of the dust control program, as implemented by the source, include records for implementation of the fugitive dust control program (Condition 2.4.9(d)(i)), and detailed records for "lapses" in the implementation of the fugitive dust control program (Condition 2.4.9(d)(ii)). Implementation of dust control measures is to be confirmed by regular "supervisory" inspections (Condition 2.1.8-1). Measurements of silt loading on plant roadways are also required to develop site-specific emission factors and confirm the effectiveness of the dust control program (Condition 2.4.8-2). Records are also required to verify the actual emissions from subject units, including records to address the amount and nature of road traffic at the plant, and the accompanying amount of particulate matter emissions (Condition 2.4.9(c) and (e)).

As a final point, as emissions from roadways and storage piles cannot be measured directly, it is necessary to rely on engineering calculations to determine emission. In this regard, the methodology in AP-42 is routinely used to determine particulate matter emissions. As applied to the proposed plant, the permit would require measurements be conducted for silt loadings on roadways at the plant, rather than using the generic data for silt loadings listed in AP-42.

Z. A number of factors all must be present simultaneously for the emissions to be within the range being modeled. First, the control efficiency must be met (and there is no basis in the record for any of them), second the silt and moisture content must be as assumed in the calculation, third the operating conditions (truck speed, truck weight, etc) must be assumed in the calculation. At a minimum, after making a specific record for each, the permit must include limits and monitoring for each of these various inputs. The measurements for silt loading required by Condition 2.4.8-2 and the recordkeeping required for some of these variables in Condition 2.4.9 would not be sufficient because there is no connection between the recorded data and emission rates, nor to specific percentage reductions (from an undefined baseline). In addition, the control efficiencies in Appendix C to the application should not be relied upon as they were used to calculate long-term (annual) emissions and not daily or hourly emission rates.

The permit appropriately addresses road dust emissions by requiring routine control with a fugitive dust control program. This comment does not identify a flaw in the modeling that was

conducted for the proposed plant. Notwithstanding the claim made in this comment, modeling for emissions from roadways is commonly conducted using average values for emissions. This is likely the result of many factors, including the method by which emissions from roadways are calculated and the effect of precipitation on emissions. It also accounts for the localized effect of road dust emissions as they occur at ground level in the vicinity of a source.

Moreover, this comment confirms that it would be inappropriate to restrict each "component" in the determination of fugitive emissions. This is because there are a variety of combinations of those components that would achieve the required emission rates.

AA. Periodic measurements of silt loading will not ensure that the silt loading is always below an apparently assumed silt loading level (which is not identified in the permit or Project Summary). Truck traffic and weather affect silt loading on a short term basis and silt loading can change dramatically over the course of several hours. Periodic measurements would not ensure continuous compliance. Moreover, they would invite measurements immediately after sweeping, which could happen very infrequently, thereby not providing representative data for silt loading during the period between sweeping.

It is not practical for measurements of silt loadings to be conducted on a continuous basis and it is not feasible, much less practical, to continuously monitor silt loadings. In this regard, roadways are similar to many emission units for which emission testing is only required on a periodic basis (or at the discretion of the regulatory authority, as deemed necessary to address specific events involving those units or provide additional emission data for the unit). As such, the permit appropriately addressed measurements for the silt loading on roadways and parking areas at the proposed plant. It provides for initial measurements to be conducted to confirm "baseline" silt loadings. It provides for mandatory performance of additional measurements in the event of significant changes that would increase silt loadings. Finally, it provides for such measurements to be promptly conducted upon request by the Illinois EPA.

In response to the concern expressed in this comment about to the timing of such measurements relative to the timing of sweeping or treatment, additional language has been included in the issued permit. It explicitly states that measurements of silt loading cannot be collected only immediately after sweeping or treatment.[112]

BB. The provision in 35 IAC 212.321 must be applied to storage piles and roadways and there must be sufficient compliance procedures

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[112] This language of the permit would accommodate sampling of silt loading at various points in the cycle of road dust emission, i.e., immediately before treatment, immediately after treatment, and during the period between treatment.

added to the permit. Alternatively, if the storage piles and roadways are too disperse to reasonably allow for mass emission limits, the Illinois EPA cannot assume such mass limits for purposes of NAAQS and increment modeling as it has done here.

The permit appropriately addresses storage piles and roadways as related to the applicability of 35 IAC 212.321. As a general matter there are inherent constraints in the application of 35 IAC 212.321, which prevent its applications to certain emission units. The application of 35 IAC 212.321 necessitates a determination of both the actual particulate emissions of an emission unit and the process weight rate of the unit, from which the allowable particulate emissions are calculated. The need for a determination of a process weight rate makes the application of this rule to certain emission units either arbitrary or impossible. In particular, how should the process weight rate of a storage pile or a roadway be determined so as to provide a meaningful relationship to the emissions that are allowed from such a unit? The inappropriateness of applying 35 IAC 212.321 to certain emission units is addressed by 35 IAC 212.323, which explicitly provides that 35 IAC 212.321 is not applicable to storage piles. Similar difficulties would be posed if one attempted to apply 35 IAC 212.321 to emissions from roadways, so roadways must also be excluded from 35 IAC 212.321 pursuant to 35 IAC 212.323.[113]

These circumstances with respect to the applicability of 35 IAC 212.321 to roadways and storage piles do not demonstrate that it is not possible to apply limits on the amount or mass of emissions from these units. Indeed, the amounts of emissions from such units are now routinely addressed, with limits on emissions established in construction permits in appropriate circumstances.

CC. The Illinois EPA's apparent assumption of constant enforceable emission limits on the emission units addressed by Section 2.4 of the permit, which were used to model purportedly worst case emissions, and establish limits in Condition 2.4.6(a) for the emissions of these units are inconsistent with the Illinois EPA's assertion in Condition 2.4.4(a) that the emissions from these same emission points are too disperse to reasonably apply the mass emission rate limits in 35 IAC 212.321. Either the emission rates that the Illinois EPA assumed as worst case for purposes of modeling (which included impossibly optimistic constant control efficiencies) are enforceable and usable for modeling, or the emissions are too disperse to be able to apply lb/hour limits from 35 IAC 212.321. It cannot be both.

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[113] Illinois' two "process weight rules" for emissions of particulate matter, 35 IAC 212.321 and 212.322, were likely developed to address a simpler understanding of process emission units as they entail equipment and processing of materials, as occur with furnaces, reactors, crushers, mixers and coating lines, rather than roadways. As such, the potential applicability of 35 IAC 212.321 and 212.322 to roadways was not contemplated during the rulemaking and 35 IAC 212.323 was not further developed to specifically identify activities to which 35 IAC 212.321 and 212.322 would not apply other than storage piles.

As already discussed, this comment reflects a misunderstanding of 35 IAC 212.321. The fact that 35 IAC 212.321 is not applicable to storage piles and roadways does not mean that limits on the amount of emission from such units cannot be established.

DD. The draft permit does not contain an enforceable limit on emissions of volatile organic compounds (VOC) to ensure that the plant is a minor source. There must be an enforceable limit, with compliance procedures, to ensure minor source status.

The emissions of VOC or volatile organic material (VOM) from the plant and the kilns, which would be the source of VOC emissions from the plant, are limited by Conditions 1.1(a) and 2.1.6(a), respectively. The emission testing required for the kilns, Condition 2.1.7, includes testing for emissions of VOM. The recordkeeping for the kilns includes recordkeeping for emissions of VOM (See Condition 2.1.10(c)(iv)).

GENERAL COMMENTS

a. When I recently toured Mississippi Lime's facility in Ste. Genevieve, Missouri, what I saw, from my experience, was a well-maintained, well-operated, and well-controlled facility.

b. I am opposed to the proposed plant even with the jobs it would provide. The plant would add significant amounts of emissions into the air. People living in Prairie du Rocher already have enough health problems. This plant would just add to them. I am also concerned about the health of my children. Nobody can guarantee to me that the plant would be 100 percent safe and would not pose any risk.

c. Mississippi Lime is owned by good people who have operated in Ste. Genevieve for many years, providing good paying jobs with benefits. Prairie du Rocher also needs jobs from a company like Mississippi Lime.

d. Prairie du Rocher will not be the same once this plant is built. And Prairie du Rocher is such a lovely town, and it is a tourist attraction, along with Fort de Chartres.

e. I think that proposed plant would be allowed to emit a lot and I am concerned about impacts on public health. I am especially concerned about the emission of fine particulate or $PM_{2.5}$, which can pass through the upper respiratory system and enter the lungs.

f. I encourage the Illinois EPA to issue this permit because of the benefit it would provide, jobs for this community and the region, the taxes it would pay, and the lime for all those that use this material.

g. In Prairie du Rocher, when people burn leaves in the fall, the smoke will sometimes get to about bluff level and seem to just

hang there. I am afraid that this could also happen with the proposed plant.

h. The salaries paid to employees at the plant will turn over several times locally before the money leaves the community. This will greatly benefit Prairie du Rocher and Randolph County.

i. Even though the air quality modeling for the proposed plant shows that the air would continue to be clean, I am still concerned. I come from Granite City. While its air quality has gotten better, the air is not yet clean. Many people in area have serious respiratory problems. There are many children with asthma. Many people have cancer and heart disease. A study was just was released about an interaction between $PM_{2.5}$ diabetes.

j. I have lived in Ste. Genevieve for 31 years. I have not experienced any health problems from living in Ste Genevieve. I can understand people's concerns, but Mississippi Lime has been a competent company. People should be pleased to have them as a neighbor.

k. The issue of climate change is especially relevant to Prairie du Rocher. It is located in the floodplain of the Mississippi River, below the confluence of three major rivers, the Mississippi, the Missouri and the Illinois. Climate change has brought more intense rain events and higher river levels. In recent years, there have been a number on flood events with higher river levels on all three river systems. The Village of Prairie du Rocher is at risk. It barely missed being flooded in 1993.

FOR ADDITIONAL INFORMATION

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

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

Condition 1.10:

This condition from the draft permit is not carried over to the issued permit. This condition indicated that the recordkeeping and reporting required by this permit might be revised in the CAAPP permit for the source. This action was taken in response to a comment that requested that the condition be revised to state that such actions could only make requirements more stringent. Rather than revise the condition as requested, it was decided that the condition would be removed to avoid controversy about a matter that would be more efficiently addressed during the processing of CAAPP permits for the source.

Condition 2.2.6(a), 2.3.6(a) and Attachment A
Various corrections made to emission limits for material handling operations to correct rounding and transposition errors and to maintain consistency with the emission rates used in modeling.

Condition 2.2.7-3

A condition is added to the permit to address testing for stack emissions of fuel and limestone handling operations. This addresses a possible gap in the compliance procedures for these operations that was identified when preparing the final permit.

Condition 2.4.8-2

This condition, which addressed measurements of silt loadings on roadways, has been revised to explicitly state that such measurements cannot only be taken immediately after treatment of roadways. This change was made in response to a comment expressing concern that such an approach to this sampling, which would not be appropriate, was not be clearly precluded by the language of the draft condition.