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## FINDINGS

1. Mississippi Lime Company (Mississippi Lime) has requested a construction permit for a new lime manufacturing plant with two pre-heater rotary lime kilns. The preheaters on the kilns will improve the energy efficiency of the kilns and reduce emissions of pollutants, including carbon dioxide. The kilns would be equipped with a fabric filter for control of emissions of particulate matter (PM).
2. The proposed plant would be located in a portion of Randolph County that is currently designated attainment for all criteria pollutants.
- 3a. This proposed plant has the potential to emit more than 100 tons per year of sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) and carbon monoxide (CO), as further described in Attachment 1. The proposed construction of the lime plant is subject to PSD review as a major source of SO<sub>2</sub>, NO<sub>x</sub> and CO emissions.
- b. The plant also has the potential to emit significant amounts of particulate matter, as PM, PM<sub>10</sub> and PM<sub>2.5</sub> and is also subject to PSD review for particulate matter.
- c. The potential emissions of the lime plant for other PSD pollutants would not be significant.

Note: Pursuant to 40 CFR 52.21(b)(49)(iv), greenhouse gases (GHGs), including carbon dioxide, are not yet a "PSD pollutant," regulated under the PSD program.

- d. This proposed plant has the potential to emit more than 10 tons per year of an individual hazardous air pollutant (HAP), i.e., hydrogen chloride (HCl). Accordingly, the proposed plant is a major new source for emissions of HAPs and a case-by-case determination of Maximum Achievable Control Technology (MACT) for HAP emissions is required by Section 112(g) of the Clean Air Act for the emission units at the plant whose emissions would not currently be subject to federal National Emission Standards for Hazardous Air Pollutants (NESHAP), as adopted by USEPA at 40 CFR Part 63.
- 4a. After reviewing the application submitted by Mississippi Lime, the Illinois EPA has determined that the application for a construction permit for the plant shows that the plant: (i) will comply with all applicable state emission standards, (ii) will comply with all applicable federal New Source Performance Standards (NSPS), (iii) will comply with all applicable federal NESHAP standards, and (iv) will utilize Best Available Control Technology (BACT) on emissions of SO<sub>2</sub>, NO<sub>x</sub>, CO, PM, PM<sub>10</sub> and PM<sub>2.5</sub>. (See the Control Technology Determinations in Section 2 of this permit for the determinations of BACT for different emission units.)
- b. For emission units that are not subject to NESHAP standards adopted by USEPA at 40 CFR Part 63, the determinations of BACT for those units also represent a case-by-case determination of MACT for the HAP emissions of those units.

5. The air quality analyses submitted by Mississippi Lime and reviewed by the Illinois EPA shows that the plant, as proposed, will not cause violations of the ambient air quality standards for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, and CO. The air quality analysis also shows compliance with the allowable PSD increments.
6. The Illinois EPA has determined that the application for a permit for the plant would comply with standards for permit issuance under applicable Board Regulations and the federal regulations.
7. A copy of the application, the Illinois EPA's project summary, and a draft of this permit were placed in a location in the vicinity of the project, and the public was given notice and opportunity to examine this material, submit comments and to participate in public hearing on this matter.

## SECTION 1: PLANT-WIDE CONDITIONS FOR THE LIME PLANT

### 1.1 Annual Emission Limitations

- a. Emissions from the plant shall not exceed the limitations in Attachment 1. For purpose of determining compliance with these limitations, the procedures in the unit-specific conditions of this permit shall be followed unless other credible evidence provides a more accurate estimate of emissions.

### 1.2 Compliance With Emission Limitations

- a. In this permit, except as otherwise specified in a particular provision, the emission limitations for "particulate matter" or "PM" shall apply to particulate matter as would be measured by USEPA Reference Method 5, rather than to PM<sub>10</sub> or PM<sub>2.5</sub>. The limitations for PM emissions also serve to limit emissions of PM<sub>10</sub> and PM<sub>2.5</sub>, as measured by applicable USEPA methods for measurement of filterable emissions, since filterable PM<sub>10</sub> and filterable PM<sub>2.5</sub> are a subset of PM.
- b.
  - i. Except as provided below or unless otherwise specified in a particular provision, compliance with annual limitations established by this permit shall be determined from a running total of 12 months of data, i.e., from the sum of the data for the current month and data for the preceding 11 months (12 month total).
  - ii. For the first year (12 months) of operation, compliance shall be determined for a cumulative total of monthly data, i.e. from the sum of the data for the current month and data for all preceding months.

### 1.3 State Emission Standards of General Applicability

- a. Emissions of PM from process emission units at the plant that are subject to 35 IAC 212.321 shall not exceed the applicable emission rate specified by 35 IAC 212.321(a) and (c).

Note: 35 IAC 212.321 provides that no person shall cause or allow the emission of PM into the atmosphere in any one hour period from a new process emission unit which, either alone or in combination with the emission of PM from all other similar new process emission at a source or premises, exceeds the allowable emission rates specified in 35 IAC 212.321(c).

- b. In addition to other applicable requirements, each emission unit at the lime plant shall comply with 35 IAC 212.123(a), which provides that no person shall cause or allow emissions of smoke or other particulate matter with an opacity greater than 30 percent, except as allowed by 35 IAC 212.123(b) and 212.124. Compliance with this limit shall be determined in accordance with by 35 IAC 212.109, i.e., by 6-minute averages of opacity measurements in accordance with USEPA Reference Method 9.

- c. In addition to other applicable requirements, each emission unit at the plant shall comply with 35 IAC 212.301, which provides that no person shall cause or allow emissions of fugitive PM to be visible from any process, including any material handling or storage activity, when looking generally toward the zenith at a point beyond the property line of the source, except when the wind speed exceeds 25 miles per hour, as provided by 35 IAC 212.314.

#### 1.4 Good Air Pollution Control Practices

The Permittee shall operate and maintain the emission units at the plant, including associated air pollution control measures and equipment, in a manner consistent with good air pollution control practice, as follows:

- a. At all times, including periods of startup, shutdown, malfunction or breakdown, operate as practicable to minimize emissions.
- b. Conduct routine inspections and perform appropriate maintenance and repairs to facilitate proper functioning of equipment and minimize or prevent malfunctions and breakdowns.
- c. Install, calibrate and maintain required monitoring devices and instrumentation in accordance with good monitoring practices, following the manufacturer's recommended operating and maintenance procedures or such other procedures as otherwise necessary to assure reliable operation of such devices.

#### 1.5 Records for Required Monitoring Systems and Instrumentation

- a. The Permittee shall keep records of the data measured by required monitoring systems and instrumentation. Unless otherwise provided in a particular condition of this permit, the following requirements shall apply to such recordkeeping:
  - i. For required monitoring systems, data shall be automatically recorded by a central data system, dedicated data logging system, chart recorder or other data recording device. If an electronic data logging system is used, the recorded data shall be the hourly average value of the particular parameter for each hour. During periods when the automatic recording device is out of service, data shall be recorded at least once per shift for periods when the associated emission unit(s) is in service.
  - ii. For required instrumentation, the measured data shall be recorded manually at least once per day, unless otherwise specified, with data and time both recorded, for periods when the associated emission unit(s) are in service, provided however that if data from an instrument is recorded automatically, the above provisions for recording of data from monitoring systems shall apply.

- b. The Permittee shall keep records for the operation, calibration maintenance and repair of required monitoring systems and instrumentation.

#### 1.6 General Recordkeeping Requirements

- a. The Permittee shall keep records for all opacity measurements made in accordance with USEPA Method 9 for emission units at the lime plant that it conducts or that are conducted on its behest by individuals who are qualified to make such observations. For each occasion on which such measurements are made, these records shall include the formal report for the measurements if conducted pursuant to this permit or a request from the Illinois EPA, or otherwise the identity of the observer, a description of the measurements that were made, the operating condition of the relevant emission units or operations, the observed opacity, and copies of the raw data sheets for the measurements.
- b. The Permittee shall keep records for all observations for visible opacity measurements made in accordance with USEPA Method 22 for emission units at the plant that it conducts or that are conducted on its behest. For each occasion on which such observations are made, these records shall include the written report for the observations if conducted pursuant to this permit or otherwise the identity of the observer, a description of the observations that were made, the operating condition of the relevant emission units or operations, and whether visible emissions were observed.
- c. The Permittee shall maintain a log or other records that summarize public inquiries or complaints related to emissions, including nuisance dust or odors, and specific actions taken by the Permittee in response to such inquiries or complaints.

#### 1.7 Retention and Availability of Required Records

- a. The Permittee shall retain all records and logs required by this permit for at least five years from the date of entry (unless a longer retention period is specified by a particular provision, keep the records at a location at the plant that is readily accessible to the Illinois EPA and USEPA, and make records available for inspection and copying by the Illinois EPA or USEPA upon request.
- b. The Permittee shall retrieve and print on paper during normal plant office hours any records retained in an electronic format (e.g., computer) in response to an Illinois EPA or USEPA request for records during the course of a plant inspection.

1.8 Plant-Wide Reporting

- a. The Permittee shall submit Semi-Annual Compliance Reports as specified in the unit-specific conditions of this permit and Condition 3.4(b).
- b. The Permittee shall submit an Annual Emission Report in accordance with 35 IAC Part 254.
- c.
  - i. The Permittee shall notify the Illinois EPA within 30 days of any deviation from the annual emission limitations set for the plant in Condition 1.1. Any such notification shall include the information specified in Condition 3.4.
  - ii. Notwithstanding the above or provisions in the Unit Specific Conditions of this permit for reporting deviations, if deviation will occur from required maintenance, repair or other activity that can be scheduled in advance, the Permittee shall also notify the Illinois EPA prior to undertaking such activity, if it is feasible to do so. Such notification shall be submitted at least 5 days in advance unless the activity is scheduled less than 5 days in advance. Such notification shall be followed by such other notification or reporting as required for the deviations.

1.9 Submission of Reports

- a. Any required reports and notifications shall be sent to the Illinois EPA at the following address unless otherwise indicated:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Enforcement Compliance Section (#40)  
P.O. Box 19276  
Springfield, Illinois 62794-9276

Telephone: 217/782-5811 Fax: 217/524-4710
- b. A copy of all required reports and notifications, except the Annual Emission Report required by 35 IAC Part 254, shall also be sent to the Illinois EPA at the following address:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
2009 Mall Street  
Collinsville, Illinois 62234

Telephone: 618/346-5120
- c. A copy of required reports and notifications concerning emission testing and initial installation and certification of continuous emission monitoring systems shall also be sent

directly to the Illinois EPA's Source Monitoring Unit at the following address:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Source Monitoring Unit  
9511 West Harrison  
Des Plaines, Illinois 60016

1.10 Authorization to Operate

- a. The lime plant may be operated pursuant to this construction permit for a period of one year from initial startup of operation of a kiln, during which period equipment shakedown and required emission testing shall be conducted. If this period is insufficient for equipment shakedown and emissions testing, the Illinois EPA may extend this initial operating period for up to 12 months pursuant to a written request from the Permittee.
- b. Upon successful completion of the initial emissions testing required for the lime plant by Conditions 2.1.7(a) (i), the Permittee may continue to operate the plant pursuant to this construction permit until the Illinois EPA takes final action on the Permittee's request for an operating permit, provided that the Permittee has submitted a timely and complete CAAPP permit application for the plant within 12 months of initial startup of operation of the plant, as provided by Section 39.5(5) (x) of the Environmental Protection Act.
- c. These conditions supersede Standard Condition 6.

1.11 Effect of Permit

- a. This permit does not relieve the Permittee of the responsibility to comply with all local, state and federal regulations that are part of the applicable Illinois' State Implementation Plan, as well as all other applicable federal, state and local requirements.
- b. In particular this permit does not excuse the Permittee from the obligation to undertake further actions at the plant as may be needed to eliminate air pollution, including nuisance due to dust or odors, such as altering process operating conditions for the kiln or raising the height of the kiln stack.

SECTION 2.0: UNIT-SPECIFIC CONDITIONS

2.1 Unit-Specific Conditions for the Lime Kilns

2.1.1 Description

The plant will produce lime by "calcination" or high-temperature roasting of crushed limestone in rotary kilns. A rotary kiln is a long, cylindrical, horizontal furnace, lined with refractory, through which the limestone and combustion gases pass in opposite directions, in counter-current flow. The kiln is slightly inclined, with stone feed going in at the higher end and lime product coming out at the lower end, where the burner is located. The heating of the limestone is facilitated by rotation of the kiln about its horizontal axis.

Each kiln will be equipped with a preheater at the exhaust end of the kiln, before the add-on air pollution control. The preheater would heat the stone feed that will go into the kiln using the thermal energy contained in the hot flue gas from the kiln. The use of preheaters will lower the amount of fuel that is needed to make lime, in Btu per ton, increasing the energy or fuel efficiency of the kilns.

The emissions of the kilns are controlled by a combination of design, work practices and add-on emission control equipment. Emissions of NO<sub>x</sub>, CO and VOM are controlled by the design of the kilns and low excess air and good combustion practices. PM emissions are controlled by add-on baghouses or fabric filters. SO<sub>2</sub> emissions are controlled by the natural ability of limestone and lime dust to absorb SO<sub>2</sub>, with SO<sub>2</sub> then being removed from the flue gas in the dust collected by the fabric filters.

2.1.2 List of Emission Units

Emission Unit	Description	Control Equipment
Lime Kilns	Two Preheater Lime Kilns	Fabric Filters

2.1.3-1 Applicability Provisions

- a. The "affected kilns" for the purpose of these unit-specific conditions are the kilns described in Conditions 2.1.1 and 2.1.2.

2.1.3-2 Control Technology Determination

- a. The emissions of the affected kilns shall be minimized and controlled by the following:
  - i. Use of preheaters or other similar heat recovery devices for improved fuel efficiency, which devices shall be designed to achieve emission rates, in tons per ton of lime product on an average annual basis, of 1.57 for carbon dioxide (CO<sub>2</sub>) and 1.58 for carbon dioxide

equivalents (CO<sub>2e</sub>), considering the combined emissions of CO<sub>2</sub>, methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O).

- ii. Low excess air to minimize formation of NO<sub>x</sub>.
  - iii. Good combustion practices to minimize formation of CO.
  - iv. The natural absorptive capacity of lime kiln dust for SO<sub>2</sub>.
  - v. Fabric filtration (baghouses) to control PM, PM<sub>10</sub> and PM<sub>2.5</sub>.
- b. i. The emissions from each affected kiln, expressed in terms of pounds per ton of lime from the kiln, shall not exceed the following limits. For the purpose of determining compliance with these limits, the ratio of stone feed to the kiln to lime output shall be no less than 2 to 1.
- A. PM (filterable only): 0.14 lbs/ton, 3-hour average.
  - B. PM<sub>10</sub> (total): 0.18 lbs/ton, 3-hour average.
  - C. PM<sub>2.5</sub> (total): 0.105 lbs/ton, 3-hour average.
  - D. SO<sub>2</sub>: 0.645 lbs/ton, daily (24-hour) average.
  - E. NO<sub>x</sub>: 3.5 lbs/ton, daily (24-hour) average.\*
  - F. CO: 2.5 lbs/ton, daily (24-hour) average.\*
- \* If continuous emissions monitoring is not conducted, as addressed by Condition 2.1.8-1(a)(v), compliance shall be determined based on a 3-hour average.
- ii. The limits in Condition 2.1.3-2(b)(i) shall not apply to an affected kiln during periods when the kiln is on hot standby with no stone feed to the kiln or the kiln is operating at less than 20 percent of capacity, provided, however, that the emission limits in Condition 2.1.6(a) shall continue to apply during these periods and serve to constitute Best Available Control Technology.
- c. i. The affected kilns and associated emission control systems shall be operated in conformance with good air pollution control practices to minimize emissions, as further addressed by Condition 2.1.5(b).
- ii. During startup of a kiln, auxiliary fuel (i.e., distillate fuel oil or natural gas) shall be fired to bring the kiln and its associated control equipment up to the operating temperature before beginning firing of solid fuel.

- iii. Upon occurrence of a malfunction or breakdown of an affected kiln that will result in an exceedance of an applicable limit in Condition 2.1.3-2(b), the Permittee shall, as soon as practicable, reduce the operating rate of the kiln, switch to firing of auxiliary fuel, begin the shutdown of the kiln or take other corrective action to end the exceedance. Consistent with the above, if the Permittee has maintained and operated the kiln and air pollution control equipment so that malfunctions and breakdowns causing exceedances are infrequent, sudden, not caused by poor maintenance or careless operation, and in general are not reasonably preventable, the Permittee shall begin corrective actions within two hours (120 minutes) of a malfunction that will result in an exceedance.

#### 2.1.3-3 Applicability of Federal Emission Standards

- a.
  - i. The affected kilns are subject to the NESHAP for Lime Manufacturing Plants, 40 CFR 63, Subpart AAAAA (the Lime Plant NESHAP), and related provisions in 40 CFR 63, Subpart A, General Provisions.
  - ii. Pursuant to the Lime Plant NESHAP, the particulate matter emissions of each affected kiln shall not exceed 0.10 pounds per tons of stone feed.
- b.
  - i. The affected kilns are subject to the federal New Source Performance Standards (NSPS) for Lime Manufacturing Plants, 40 CFR 60, Subpart HH (the Lime Plant NSPS), and related provisions in 40 CFR 60, Subpart A, General Provisions. The Illinois EPA administers NSPS in Illinois on behalf of the United States EPA under a delegation agreement.
  - ii. Pursuant to the Lime Plant NSPS, the particulate matter emissions of the affected kilns, which are controlled by a fabric filter, shall each not exceed 15 percent opacity and 0.30 kilogram per megagram (0.60 lb/ton) of stone feed, as would be measured by USEPA Method 5, except during startup, shutdown and malfunction, as defined by 40 CFR 60.2, as provided by 40 CFR 60.8(c) and 60.342.
- c. At all times, the Permittee shall also maintain and operate the affected kilns, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions, as required by the NSPS, 40 CFR 60.11(d), and the NESHAP, 40 CFR 63.6(e) (1) (i).

#### 2.1.3-4 Applicable State Emission Standards

- a. The PM emissions of each affected kiln shall comply with 35 IAC 212.321. (See also Condition 1.4(a).)

- b. The opacity of PM emissions from each affected kiln shall comply with 35 IAC 212.123(a). (See also Condition 1.4(b).)

Note: Notwithstanding Condition 2.1.3-4(a) or (b), in the CAAPP Permit for the source, the Permittee may be authorized, subject to appropriate restrictions, to start up the affected kilns or continue operation of the kilns in violation of state emission standard(s) pursuant to 35 IAC 201.262 if the Permittee demonstrates that such emissions during startup have and will be minimized and that such continued operation during malfunction or breakdown is necessary to prevent injury to persons or severe damage to equipment.

#### 2.1.3-5 Nonapplicability Provisions

- a. The affected kilns are not subject to the SO<sub>2</sub> standard of 35 IAC 214.301 pursuant to 35 IAC 214.402, which excludes lime kilns from all SO<sub>2</sub> emission standards in 35 IAC Part 214.

#### 2.1.4 Operational Limits

- a. The total lime production of the affected kilns, determined as oxides (CaO and MgO), shall not exceed 2,400 tons/day, monthly average.
- b. The solid fuel usage by the affected kilns shall not exceed 263,000 tons/year.

#### 2.1.5 Operational Requirements

- a. The Permittee shall operate the affected kilns and associated emission control equipment in accordance with good air pollution control practices to minimize emissions, including the following:
  - i. Operation in accordance with detailed written operating procedures, as it is safe to do so, that at a minimum address startup (including so called "cold startups" and "hot startups" when the operation of the kiln is only temporarily interrupted), normal operation, and shutdown and malfunction events, establish target ranges for relevant operating parameters, and provide for review of these parameters during startup, shutdown and malfunction or breakdown as necessary to make adjustments to reduce or eliminate any excess emissions.
  - ii. With respect to startup, performance of an appropriate operating review of the operational condition of the kiln prior to initiating startup of the kiln and firing of auxiliary fuel to "preheat" the kiln to the operating temperature of the control equipment prior to initiating firing of solid fuel, maintaining opacity of the kiln during this preheat period at a level that is indicative of good combustion for auxiliary fuel, except for the initial 12 minute period following ignition of auxiliary fuel.

- iii. With respect to malfunction and breakdown, include planning for likely events with specific programs of corrective actions; provide that, upon occurrence of a malfunction that will result in an exceedance of a limit or requirement in Condition 2.1.3-2, 2.1.3-3, 2.1.3-4 or 2.1.6, appropriate corrective actions are implemented as soon as practicable (e.g., repair of the affected equipment, a reduction in the operating rate of the kiln, or removal of the kiln from service) so that excess emissions are minimized and the exceedance expeditiously end; and provide for timely shutdown and overhaul of the kiln upon occurrence of chronic malfunctions that result in excess emissions.
- iv. Pursuant to 40 CFR 63.7100(e), the Permittee shall develop and implement a written startup, shutdown and malfunction plan (SSM Plan) in accordance with 40 CFR 63.6(e)(3).
- b. Pursuant to the NESHAP, the Permittee shall maintain and operate each affected kiln in accordance with 40 CFR 63.7090(b), Item 1 of Table 2 of the Lime Plant NESHAP, and either Item 2 or 4 of Table 5 of the Lime Plant NESHAP.
- c. The Permittee shall maintain the affected kilns and associated air pollution control systems in accordance with good air pollution control practice to assure proper functioning of equipment and minimize malfunctions, including performing maintenance in accordance with written procedures developed for this purpose. The procedures may rely upon the manufacturer's instructions for maintenance of equipment, provided that a copy of those instructions is attached to the procedures. These procedures may also be combined with the required operating procedures for the kiln.
- d. The Permittee shall review its operating and maintenance procedures as required above on a regular basis and revise them as needed consistent with good air pollution control practice based on actual operating experience and equipment performance.
  - i. This review shall occur at least annually if not otherwise initiated by occurrence of a startup, shakedown, or malfunction event that is not adequately addressed by the existing plans.
  - ii. This review shall also be performed if, following the shakedown period allowed by Condition 1.10, the kiln experiences chronic malfunctions that result in excess emissions or a specific request by the Illinois EPA for such review.

Note: The Illinois EPA may enhance these requirements through action in a CAAPP permit for the plant based on the actual operating experience with the affected kilns.

2.1.6 Emission Limitations

- a. The emissions of the affected kilns shall not exceed the following limits.

Pollutant	Each Kiln			Combined
	Short-Term Limits		Annual Limits (Tons/Yr)	Annual Limits (Tons/Yr)
	Rate (Lbs/Hr)	Averaging Time		
PM/PM <sub>10</sub> (filterable only)	7.1	3-hour	31.0	62.0
PM <sub>10</sub> (total)	8.8	3-hour	42.2	84.5
PM <sub>2.5</sub> (total)	5.24	3-hour	22.95	45.9
SO <sub>2</sub>	32.3	3-hour	141.5	283
NO <sub>x</sub>	175.0	3-hour	766.5	1,533
CO	125.0	daily, 24-hour	547.5	1,095
VOM	2.51	3-hour	11.0	22.0
Sulfuric Acid Mist	0.68	3-hour	3.0	6.0
Lead	0.000010	3-hour	0.000040	0.000080
Hydrogen Chloride	4.69	3-hour	20.5	41.0

2.1.7 Emissions Testing Requirements

The Permittee shall have testing of the emissions of the affected kilns conducted as follows:

- a. The timing and scope of these tests shall be as follows:
- i. A. Pursuant to the NSPS and NESHAP, 40 CFR 60.344 and 63.7112, within 180 days of the initial startup of each affected kiln, the Permittee shall have testing conducted for the kiln's emissions of PM.
  - B. Within one year of the initial startup of each kiln, the Permittee shall also have testing conducted for the kiln's emissions of PM<sub>10</sub>, PM<sub>2.5</sub>, VOM, hydrogen chloride, sulfuric acid, and lead and other metals.
  - ii. Pursuant to the NESHAP, 40 CFR 63.7111, within five years following the initial test for PM emissions on each affected kiln and within five years following each subsequent test thereafter, the Permittee shall have tests conducted for PM emissions in accordance with 40 CFR 63.7112.
  - iii. Additional testing of emissions shall be conducted within 90 days of a written request from the Illinois EPA for pollutants as specified by the request, including emissions of CO or NO<sub>x</sub> if continuous emissions monitoring is not required for these pollutants.
- b. Testing shall generally be conducted in accordance with the procedures and method specified in Condition 3.1 using USEPA

test methods and procedures unless another method is approved by the Illinois EPA. In addition:

- i. Testing for emissions of PM shall be conducted in accordance with the NSPS, 40 CFR 60.344, and NESHAP, 40 CFR 63.7110 through 63.7114.
  - ii. Testing for emissions of hydrogen chloride shall be conducted in accordance with relevant provisions of the NESHAP, 40 CFR 63.7142.
- c. The Permittee shall submit a test plan to the Illinois EPA for this testing in accordance with Condition 3.1(d) and notify the Illinois EPA of the date of emissions testing in accordance with Condition 3.1(e).
- d. The Permittee shall submit final reports for this testing to the Illinois EPA in accordance with Condition 3.1(f). In addition to other required information, these reports shall also include:
- i. The following information for the operating conditions during testing:
    - A. Ash, sulfur, and heat content of the solid fuel being fired, based on representative sampling of fuel during the period of testing.
    - B. The amounts of stone and solid fuel fed to the kiln, in tons/hour.
    - C. The amounts of lime produced, in tons/hour.
    - D. Kiln operating parameters, i.e., operating temperature and oxygen content in the flue gas leaving the kiln.
    - E. Fabric filter operating parameters, i.e., pressure drop and operating temperature, and operating information, i.e., output from the bag leak detection system and frequency of bag cleaning with trigger for cleaning.
  - ii. Emission factors for the kiln, calculated using the average test results in terms of pounds per ton of stone feed and pounds per ton of lime product.
  - iii. Opacity of the emissions from the kiln, as determined by the continuous opacity monitor.

#### 2.1.8-1 Emissions Monitoring Requirements

- a. The Permittee shall install, calibrate, maintain and operate continuous emissions monitoring systems (CEMS) on each affected kiln for SO<sub>2</sub>, NO<sub>x</sub> and CO emissions in accordance with 40 CFR 60,

Appendix B, Performance Specification 2 and 4, respectively and Appendix F. These systems shall be operated during all periods of operation of a kiln except for continuous monitoring system breakdowns and repairs. Data is to be recorded during calibration checks, and zero and span adjustments.

- b. The Permittee shall maintain records for these CEMS, including recorded emission concentrations, records of maintenance, calibration, and operational activity associated with the systems, and the following information:
  - i. Records of measured SO<sub>2</sub>, NO<sub>x</sub>, and CO emissions, in pounds/hour, and pounds/hour, daily (24-hour) average;
  - ii. Records identifying periods when the pollutant concentration exceeded the full span of the CEMS;
  - iii. Records describing any modifications to these CEMS that could affect the ability of the CEMS to comply with Performance Specification 3 or 4; and
  - iv. Records for the results of daily CEMS drift tests and quarterly accuracy assessments as required under Appendix F, Procedure 1 of 40 CFR 60.
- c. During extended outages of the SO<sub>2</sub> CEMS, the Permittee shall measure and record the exhaust concentration of SO<sub>2</sub>, with measurement by gas tubes or equivalent techniques, at least twice per shift.
- d. The Permittee shall submit reports to the Illinois EPA of monitoring of SO<sub>2</sub>, NO<sub>x</sub> and CO emissions, including data for exceedances of applicable short-term limits. (See also Condition 2.1.10(d)(iv).)
- e. The Illinois EPA may revise or terminate requirements for monitoring of NO<sub>x</sub> or CO emissions or allow operational monitoring of oxygen as an alternative to monitoring of NO<sub>x</sub> or CO, through action on the CAAPP permit for the source based on a showing from the Permittee that monitoring for NO<sub>x</sub> or CO does not facilitate practices to minimize CO or NO<sub>x</sub> emissions or is not appropriate given actual levels of NO<sub>x</sub> or CO emissions from the kiln, or that monitoring of oxygen is adequate to address emissions of NO<sub>x</sub> or CO.

#### 2.1.8-2 Opacity Monitoring Requirements

- a. i. The Permittee shall install, calibrate, maintain and operate a continuous opacity monitoring system to measure the opacity of the exhaust from each affected kiln in accordance with 40 CFR 60.11 and 60.343(a).
- ii. These continuous opacity monitors shall also be operated in accordance with the applicable requirements of the Lime Plant NESHAP, including 40 CFR 63, Subpart AAAAA,

Table 4, Item 11, unless the Permittee conducts monitoring with a Bag Leak Detector System or a Particulate Matter Detector System in accordance with the applicable requirements of this NESHAP.

- b. The Permittee shall submit reports of excess opacity measured by this system to the Illinois EPA in accordance with 40 CFR 60.7(c) and, if applicable, 40 CFR 60.343(e).
- c. These requirements for continuous opacity monitoring pursuant to the Lime Plant NSPS will no longer apply if: 1) The NSPS or NESHAP are revised to allow operation of a Bag Leak Detector System or a Particulate Matter Detector System to serve as an alternative to continuous opacity monitoring pursuant to the NSPS; and 2) The Permittee implements use of such an alternative system in accordance with applicable requirements of the Lime Plant NSPS and/or NESHAP.

#### 2.1.8-3 Operational Monitoring Requirements

- a. Pursuant to the Lime Plant NESHAP, the Permittee shall install, calibrate, maintain, and operate monitoring devices for measuring the mass rate of stone feed to each kiln, which must be accurate to within plus or minus 5 percent of the mass rate over its operating range. The device is required to be operated during emission testing pursuant to 40 CFR 60.343(d) and Item 7 of Table 4 of the Lime Plant NESHAP.
- b. The Permittee shall install, calibrate, maintain, and operate monitoring devices for the oxygen concentration, percent by volume, in the flue gas exiting each kiln, which devices shall be installed in the ductwork between the end of the kiln and the preheater so as to minimize the effect of infiltration of air on the measured oxygen concentration.
- c. The Permittee shall install, calibrate, maintain, and operate the following monitoring devices on the fabric filter for each affected kiln:
  - i. A device to measure the pressure drop across the fabric filter.
  - ii. A device to measure the outlet gas temperature from the fabric filter.
  - iii. A Bag Leak Detector System or Particulate Matter Detector, which shall be installed, operated and maintained in accordance with relevant requirements of 40 CFR 63.7213 and Item 10 of Table 4 of the Lime Plant NESHAP. The Permittee shall keep records for alarms from this system and the actions that it takes in response to such alarms in accordance with the relevant provisions of 40 CFR 63.7121 and Item 2 of Table 5 of the Lime Plant NESHAP.

#### 2.1.8-4 Fuel Sampling and Analysis

- a. The Permittee shall have quarterly sampling conducted for the solid fuel used in the affected kilns using the procedures in ASTM D2234, which result in data at least as reliable as Classification II - D-2, defined in ASTM D2245 as "Manual Sampling - Stationary Coal/Coke Sampling - Random Spacing" and analyze these samples for ash, sulfur, and heat content using appropriate ASTM Methods. This sampling and analysis may be conducted either by the Permittee or its fuel supplier(s).
- b. The Permittee shall keep records for this activity and the results of the analysis.

#### 2.1.9 Recordkeeping Requirements

- a.
  - i. For the affected kilns, the Permittee shall fulfill applicable recordkeeping requirements of the NSPS, 40 CFR 60.7.
  - ii. For the affected kilns, the Permittee shall fulfill applicable recordkeeping requirements of the NESHAP, including 40 CFR 63.7132.
- b. The Permittee shall maintain a file that contains the following information, which shall be kept current:
  - i. For the fabric filter on each affected kiln:
    - A. The design specifications for the fabric filter, including design exhaust flow (acfm or scfm), filter area, type of cleaning, performance guarantee for particulate exhaust loading (gr/scf) and the design specification for the filter material in the fabric filter (type of material, surface treatment(s) applied to material, weight, performance guarantee and warranty provisions).
    - B. The manufacturer's recommended operating and maintenance procedures for the fabric filter.
    - C. The normal range of pressure drop across the fabric filter and the maximum safe pressure drop for the fabric filter, with supporting documentation.
  - ii. For the kilns, the design emission rates for CO<sub>2</sub> and CO<sub>2e</sub>, as achieved with the preheaters, with supporting documentation. For this purpose, emissions shall be determined using the applicable methodology for lime manufacturing in 40 CFR Part 98, *Mandatory Reporting of Greenhouse Gases and Emission Facts: Metrics for Expressing Greenhouse Gas Emissions: Carbon Equivalents and Carbon Dioxide Equivalents*.

- c. The Permittee shall maintain the following logs or other records for each affected kiln:
  - i. Operating log(s) or other records in accordance with Condition 3.3(a), which shall also include the following information:
    - A. The operating status and stone feed rate to the kiln on an hour-by-hour basis (tons).
    - B. Operating parameters of the kiln that are relevant to emissions as measured by process instrumentation, recorded at least once per shift.
    - C. Each startup of the kiln, the nature of the startup, sequence and timing of major steps in the startup, any unusual occurrences during the startup, and any deviations from the established startup procedures, with explanation.
    - D. Each shutdown of the kiln including the nature and reason for the shutdown, sequence and timing of major steps in the shutdown, any unusual occurrences during the shutdown, and any deviations from the established shutdown procedures, with explanation.
    - E. Each malfunction or breakdown that significantly impairs emission performance, including the nature and duration of the event, type of malfunction, i.e., minor or major, sequence and timing of significant steps in the malfunction, corrective actions taken, any deviations from the established procedures for such a malfunction, estimated emissions, probable cause, and preventative actions taken to address similar events.
  - ii. Inspection, maintenance and repair log(s) or other records in accordance with Condition 3.3(b).
- d. The Permittee shall keep the following operating records for the lime plant and the affected kilns:
  - i. The amounts of solid fuel received by the plant, by type (tons/month).
  - ii. Stone feed to each kiln (tons/month and tons/year).
  - iii. For solid fuel used by the kilns, by type of fuel, usage (tons/month), average sulfur content (percent by weight and pounds/million Btu), and average heat content (mmBtu/pound).
  - iv. Lime production by the kilns, as oxide (tons/month).

- e. The Permittee shall maintain records of the following items related to malfunction and breakdown of the affected kilns:
  - i. Date and duration of the malfunction or breakdown, i.e., begin time and time normal operation was achieved or time the kiln was shutdown.
  - ii. Description of the event, impact on emissions, probable cause, and corrective actions.
- f. The Permittee shall maintain records of the following items for each exceedance of the limits in Conditions 2.1.3, 2.1.5, or 2.1.6, which records shall include:
  - i. Identification of the limit that may have been exceeded.
  - ii. Duration of the possible exceedance.
  - iii. An estimate of the amount of emissions in excess of the applicable standard.
  - iv. A description of the cause of the possible exceedance.
  - v. When compliance was reestablished.
- g. The Permittee shall maintain records of the following items related to emissions of each affected kiln:
  - i. A file containing the standard emission factors used by the Permittee for estimating controlled emissions from the kiln, which information shall be based on site-specific test data, representative test data or emission determination methodology published by USEPA, with supporting explanation and calculations.
  - ii. Records of emissions of PM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, VOM, CO, and individual and total HAPs (tons/month and tons/year), with supporting calculations.

2.1.10 Notification and Reporting Requirements

- a.
  - i. The Permittee shall fulfill applicable notification and reporting requirements of the NSPS for the affected kilns and associated control systems, as required by 40 CFR 60.7 and 60.343(c).
  - ii. The Permittee shall fulfill applicable notification and reporting requirements of the NESHAP for the affected kilns and associated control systems, as required by 40 CFR 63.7130 and 63.7131, respectively.
- b. The Permittee shall promptly notify the Illinois EPA of any deviations from the requirements of this permit for the affected kiln as follows. These notifications shall include the information specified by Condition 3.4.

- i. If there is an exceedance of a state emission or opacity standard due to a malfunction or breakdown event, the Permittee shall notify the Illinois EPA in accordance with Condition 2.1.10(b).
  - ii. If there is a deviation from other applicable requirements for PM emissions, opacity or visible emissions that is not repaired or otherwise corrected within 4 hours, the Permittee shall notify the Illinois EPA within 30 days.
  - iii. The deviations addressed above and all other deviations shall be appropriately reported in the periodic compliance reports required by Conditions 2.1.10(a) and (c).
- c. The Permittee shall submit quarterly compliance reports to the Illinois EPA within 30 days following the end of each reporting period. These reports shall include the following information:
- i. The quantity of each fuel burned, in tons, gallons or scf, and the sulfur content of the solid fuel, lb/mmBtu, weighted average, on a monthly basis.
  - ii. A listing of each startup of a kiln, with brief description of the type of startup, e.g., routine startup following scheduled maintenance outage or hot startup following unplanned power outage;
  - iii. Information for deviations during the reporting period, including detailed information as required by Condition 3.4 for deviations that have not been previously reported pursuant to Condition 2.1.10(b) and a listing of deviations that have been so reported. If there have been no deviations during the reporting period, the report shall state that no deviations occurred during the reporting period;
  - iv. An availability and incident report for the SO<sub>2</sub>, NO<sub>x</sub> and CO CEMS and instrumentation required by Conditions 2.1.8-1 and 2.1.8-2.
  - v. Emissions of PM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, VOM and individual HAPs, with supporting data and calculation (tons/month and tons/year).

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

2.2.1 Description

Various operations will be present at the plant to handle the limestone feedstock for the kilns. Mississippi Lime expects that this limestone will come from an associated underground mine facility by an enclosed transfer system and further crushed to final size at the plant. Alternatively, limestone may be received by truck from an off-site quarry (Alternate Scenario). At the lime plant, the crushed limestone will be stored in stockpiles (See Section 2.4 of this permit). Limestone from the storage piles will be screened to remove material that is too small or large from the limestone that is fed to the kilns. Appropriately sized material will go to bins pending feed to the kilns. Unsuitable material will be stored or stockpiled pending loadout for alternative use.

Solid fuel for the kilns will also be handled. Solid fuel will be stored in stockpiles (See Section 2.4 of this permit). From the stockpiles, fuel will be transferred to the fuel feed bins for the kilns.

The emissions of particulate matter (PM) from these operations will be minimized by the nature of the materials, including moisture content, enclosure and work practices.

2.2.2 List of Emission Units

Operation	Emissions Units
Limestone	
Storage	Bins (EP8 and 11)
General Transfer Systems (Transfer Systems 1-3)	Transfer
	Feeder (EP4)
	Screen (EP6)
	Feeders (EP12 and 13)*
Transfer Systems for On-Site Limestone (Transfer Systems 1-3)	Conveyors (EP93-102)
	Feeders (EP109-111)
	Conveyors (EP90-92)
	Feeder (EP108)
	Screens (EP106 and 107)
Transfer Systems for Alternate Scenario (Transfer Systems 1-2)	Conveyors (EP 5, 7, 9, and 10)
	Conveyors (EP2a and 2b)
Limestone Crushing (Handling Systems 1-2)	Crushers (EP104 and EP105)
Solid Fuel	
Loading	Unloading (EP36)
	Front End Loader (EP38)
Transfer System	Feeders (EP39, EP40, EP44a and EP44b)
	Conveyors (EP42)
Final Storage	Bins (EP41a, EP41b, EP43a and EP43b)

- \* Feeders (EP12 and 13) vents to Baghouses (CD6 and CD7).

#### 2.2.3-1 Applicability Provisions

- a. The "affected units" for the purpose of these unit-specific conditions are the emission units described in Conditions 2.2.1 and 2.2.2.
- b. The "affected limestone handling operations" for the purpose of these unit-specific conditions are the limestone handling and processing operations described in Conditions 2.2.1 and 2.2.2.
- c. Affected units do not include units at the existing limestone crushing plant that are not addressed by this permit, which shall cease operation and be removed from service when the lime manufacturing plant begins operation.

#### 2.2.3-2 Control Technology Determination

- a. The PM emissions from affected limestone handling operations that, as they are "processed stone handling operations," are subject to the NESHAP, 40 CFR 63, Subpart AAAAAA or the NSPS, 40 CFR 60, Subpart OOO (see Conditions 2.2.3-3(a) or (b)), shall comply with the applicable limits specified by the NSPS and NESHAP.
- b. The PM emissions from other affected units that are not subject to the NSPS or NESHAP shall comply with the following limits:
  - i. Opacity of fugitive emissions, as defined by 40 CFR 60.671, shall not exceed 10 percent, as determined by Method 9, with observations conducted in accordance with 40 CFR 63.7112(l).
  - ii. Stack emissions, shall not exceed 0.005 gr/dscf as would be measured by Method 5 and 7 percent opacity.
  - iii. If the unit is enclosed in a building, emissions shall either not exceed the relevant limits in Conditions 2.2.3-2(b)(i) and (ii) or there shall be no visible fugitive emissions from the building except emissions from a vent, as defined in 40 CFR 60.671, and emissions from each vent from the building shall not exceed the limits for stack emissions in Condition 2.2.3-2(b)(ii).

#### 2.2.3-3 Applicable Federal Emission Standards

- a. Certain affected units engaged in handling of limestone (i.e., storage bins, conveying system, transfer points, bulk loading or unloading systems, screening operations, bucket elevators and belt conveyors), starting with the limestone storage piles at the lime plant, are subject to the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Lime Manufacturing Plants, 40 CFR 63, Subpart AAAAAA, and related provisions in 40 CFR 63, Subpart A, General Provisions.

- b. Certain affected units engaged in handling limestone (i.e., crushers, grinding mills, screening operations, bucket or belt conveyors, conveyor transfer points, storage bins, and enclosed truck loading stations constructed, modified or reconstructed after August 31, 1983) shall comply with applicable requirements of the NSPS for Nonmetallic Mineral Processing Plants, 40 CFR 60, Subpart OOO, and related provisions of 40 CFR 60, Subpart A, General Provisions.
- c. The affected units that are subject to NSPS and/or NESHAP shall comply with the following limits for PM emissions:
  - i. Limits for stack emissions, if any, from such units:
    - A. Emissions, as would be measured by Method 5, shall not exceed 0.032 gram/dscm (0.014 gr/dscf).
    - B. The opacity of emissions shall not exceed 7 percent, unless a wet scrubber is used.
  - ii. Limits for fugitive emissions from such units:
    - A. The opacity of emissions shall not exceed 7 percent.
    - B. The opacity of emissions from each crusher at which a capture system is not used shall not exceed 12 percent.
  - iii. Limits for any such units enclosed in a building:
    - A. Emissions shall not exceed the relevant limits in Conditions 2.2.3-3(c) (i) and (ii); or
    - B. There shall be no visible fugitive emissions from the building except emissions from a vent, as defined in 40 CFR 63.7143, and emissions from each vent from the building shall not exceed the limits for stack emissions in Condition 2.2.3-3(c) (i).
- d. At all times, the Permittee shall maintain and operate affected units that are subject to this NSPS, including associated emission control equipment, in a manner consistent with good air pollution control practice for minimizing emissions, pursuant to 40 CFR 60.11(d).

#### 2.2.3-4 Applicable State Emission Standards

- a. The emissions of particulate from the affected units shall comply with 35 IAC 212.123 and 212.301. (Refer to Conditions 1.4(b) and (c).)
- b. The emissions of particulate, as would be measured by Method 5, from affected units that are equipped with vents shall comply with 35 IAC 212.321. (Refer to Condition 1.4(a).)

2.2.4 Non-Applicability of Regulations of Concern

- a. This permit is issued based on affected units at the plant that handle coal not being subject to the NSPS for Coal Preparation Plants, 40 CFR 60, Subpart Y, because such units at this plant do not prepare more than 200 tons of coal per day by breaking or crushing of the coal. [See 40 CFR 60.250]
- b. Affected units that are not equipped with vents, such as storage piles and the conveyor belt system for transfer of limestone to the plant, are not subject to the limits of 35 IAC 212.321 ("the process weight rate" rule) because of the disperse nature of the units, as provided by 35 IAC 212.323.

2.2.5 Operational and Production Limits and Work Practices

- a. The transfer and loadout and unloading of dust collected by the fabric filter on the kiln shall be enclosed or shall be controlled by water spraying, pelletizing, or other equivalent control methods to prevent visible emissions of particulate.
- b. Pursuant to 40 CFR 63.7090(b) and Table 2, Item 6:
  - i. The emissions from the affected units that are controlled by fabric filters shall be vented through a closed system, except that dilution air may be added to emission streams for the purpose of controlling temperature at the inlet of fabric filter.
  - ii. Fabric filters shall be operated in according to the procedures and requirements of the operating and maintenance plan.

2.2.6 Emission Limitations

- a. Particulate matter emissions from the affected units shall not exceed the following limits. Compliance with these limits shall be determined using established USEPA methodology for calculation of particulate emissions from handling and processing of limestone and other bulk commodities.

Operation	Limit					
	PM		PM <sub>10</sub>		PM <sub>2.5</sub>	
	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr
Limestone						
Storage	0.070	0.306	0.0330	0.144	0.005	0.022
General Transfer Systems	0.177	0.774	0.0594	0.260	0.0011	0.006
Transfer Systems for On-Site Limestone	0.351	1.544	0.1290	0.565	0.0075	0.033
Transfer System for Alternate Scenario	0.006	0.033	0.0017	0.008	0.0007	0.003
Limestone Crushing	0.074	0.320	0.0248	0.109	0.0005	0.003
Subtotal		2.98		1.09		0.07

Operation	Limit					
	PM		PM <sub>10</sub>		PM <sub>2.5</sub>	
	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr
Solid Fuel						
Loading	0.010	0.031	0.003	0.0131	0.0005	0.002
Transfer System	0.001	0.006	0.001	0.0030	0.0003	0.001
Final Storage	0.010	0.044	0.003	0.0150	0.0001	0.001
Subtotal		0.09		0.04		0.01
Total		3.06		1.12		0.08

2.2.7-1 Performance Testing for Opacity

- a. The Permittee shall conduct opacity observations for each affected unit in accordance with Condition 3.2:
  - i. No later than 45 days after the date initial emission testing of the affected kilns is performed, as required by Condition 2.1.7(a) (i).
  - ii. Upon written request by the Illinois EPA, in which case observations shall be conducted within 45 days or such later date specified by the Illinois EPA.

2.2.7-2 Periodic Observations for Opacity and Visible Emission

- a. The Permittee shall periodically demonstrate compliance with applicable opacity and visible emission (VE) limits for each affected unit in accordance with 40 CFR 63.7121 and Table 6, including:
  - i. For each affected unit that is subject to a 7 or 10 percent opacity limit in Condition 2.2.3-3(d), the Permittee shall:
    - A. Conduct a monthly 1-minute VE check of each affected unit in accordance with 40 CFR 63.7121(e), while the unit is in operation.
    - B. If no VE are observed in six consecutive monthly checks for any affected unit, frequency of VE check may be decreased from monthly to semi-annually for that unit. If VE are observed during any semi-annual check for that unit, the VE check shall resume to monthly check as required in Condition 2.2.7-2(a) (i) (A) until no VE are observed for six consecutive monthly check.
    - C. If no VE are observed in semi-annual check for any affected unit, frequency of VE check required in Condition 2.2.7-2(a) (i) (B) may be decreased from semi-annually to annually for that unit. If VE are observed during any annual check for that unit, the VE check shall resume to monthly check as required

in Condition 2.2.7-2(a) (i) (A) until no VE are observed for six consecutive monthly check.

- D. If VE are observed during any VE check, the Permittee shall conduct a 6-minute test of opacity in accordance with Reference Method 9. This test shall begin the Method 9 test within 1 hour of any observation of VE and the 6-minute opacity reading shall not exceed the applicable opacity limit.
- ii. For any building subject to the requirements of a VE limit in Condition 2.2.3-3(c) (iii), the Permittee shall:
  - A. Conduct a monthly VE check of the building in accordance with 40 CFR 63.7121(k), while all the enclosed process stone limestone handling operations are operating.
  - B. The check for each affected building shall be at least 5 minutes, with each side of building and roof being observed for at least 1 minute.
  - C. The Permittee may decrease the frequency of this observation from monthly to semi-annually or semi-annually to annually as allowed in Conditions 2.2.7-2(a) (i) (B) or (C), respectively.

#### 2.2.7-3 Emission Testing

- a. The Permittee shall conduct emission testing for stack emissions of the PM of the affected units as required by 40 CFR 60, Subpart 000 and 40 CFR 63, Subpart AAAAA. In addition to be conducted in accordance with applicable requirements of these rules, this testing shall be conducted in accordance with Condition 3.1.
- b. In conjunction with emission testing required by 40 CFR 60, Subpart 000 or 40 CFR 63, Subpart AAAAA and within 90 days of a written request from the Illinois EPA, the Permittee shall have the PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions at the stacks or vents of the affected units, as specified in such request, measured during representative operating conditions. Testing shall be conducted in accordance with the procedures and method specified in Condition 3.1 using USEPA test methods and procedures.

#### 2.2.8 Inspections

- a. i. The Permittee shall conduct inspections of the affected units on at least a weekly basis with supervisory personnel or other personnel who are not engage in running the affected units on a day-to-day basis for the specific purpose of verifying that the measures required to control emissions are being properly implemented.

- ii. On at least a semi-annual basis, these inspections shall be conducted by individual who are certified observers for opacity pursuant to USEPA Method 9.
  - iii. The Permittee shall keep records documenting the performance of these inspections and their findings.
- b. The Permittee shall conduct inspections of any capture/collection and closed vent system at least once each calendar year to ensure that each system is operating in accordance with the operating requirements in Condition 2.2.5. [40 CFR 63.7121]
- c. The Permittee shall keep records documenting the performance of these inspections and their findings.

#### 2.2.9 Recordkeeping Requirements

- a. For each affected unit that is subject to NSPS, 40 CFR 60, Subpart 000, the Permittee shall fulfill applicable recordkeeping requirements of the NSPS, 40 CFR 60.7 and 60.676.
- b. For each affected unit that is subject to NESHAP, 40 CFR 63, Subpart AAAAA, the Permittee shall fulfill applicable recordkeeping requirements of the NESHAP, 40 CFR 63.7132.
- c. The Permittee shall maintain records of the throughput of each group of affected units, tons/month, by type of material, e.g., limestone, coal, petroleum coke, and kiln dust.
- d. The Permittee shall maintain the following logs or other similar records for the affected units:
  - i. Operating log(s), in accordance with Condition 3.3(a).
  - ii. Inspection, maintenance and repair log(s) or other records in accordance with Condition 3.3(b).
- e. The Permittee shall maintain records of the following items related to the emissions of affected unit:
  - i. A file containing the standard emission factors used by the Permittee for estimating emissions from the affected unit, which information shall be based on site-specific test data, representative test data, or emission determination methodology published by USEPA, with supporting explanation and calculations.
  - ii. Records of emissions of PM and PM<sub>10</sub>, (tons/month and tons/year), with supporting calculations.

#### 2.2.10 Notification and Reporting Requirements

- a. The Permittee shall promptly notify the Illinois EPA of any deviations from the requirements of this permit for an affected

unit as follows. These notifications shall include the information specified by Condition 3.4.

- i. If the affected unit is damaged so there is a deviation from applicable requirements for visible emissions that is not repaired or otherwise corrected within 1 hours (60 minutes), the Permittee shall notify the Illinois EPA within 30 days.
- ii. The deviations addressed above and all other deviations shall be reported with the periodic compliance reports required by Condition 2.1.10(c).

#### 2.2.11 Flexibility

The Permittee is authorized, as follows, to construct and operate affected units that differ from those described in the application without obtaining further approval by the Illinois EPA. This condition does not affect the Permittee's obligation to comply with all applicable requirements for affected units:

- a. This authorization only extends to changes that result from the detailed design of the plant and any refinements to that design of the affected units that occur during construction and the initial operation of the plant.
- b. With respect to air quality impacts, these changes shall generally act to improve dispersion and reduce impacts, as emissions from individual units are lowered, units are moved apart or away from the fence line, stack heights are increased, and heights of nearby structures are reduced.
- c. The Permittee shall notify the Illinois EPA prior to proceeding with any changes. In this notification, the Permittee shall describe the proposed changes and explain why the proposed changes will act to reduce impacts, with detailed supporting documentation.
- d. Upon written request by the Illinois EPA, the Permittee shall promptly have air quality dispersion modeling performed to demonstrate that the overall effect of the changes is to reduce air quality impacts, so that impacts from affected units remain at or below those predicted by the air quality analysis accompanying the application.

## 2.3 Unit-Specific Conditions for Lime Processing and Handling Equipment

### 2.3.1 Description

The plant will have equipment to handle and process the lime produced by the kilns. The lime is screened to size the product. Some of the lime from the kilns, which is quick lime (CaO), is converted to hydrated lime (Ca(OH<sub>2</sub>)). Kiln dust, i.e., lime and limestone dust collected by the baghouses on the kilns, will also be handled pending final disposition.

The emissions of particulate matter (PM) from this equipment will be controlled by a combination of work practices and fabric filters (baghouses).

### 2.3.2 List of Emission Units

Operation	Emissions Units		Associated Baghouse(s)
Lime			
Quick Lime Systems	Feeders, Conveyors, and Pneumatic Conveyor		CD 1/2, CD3/4, CD62 and CD63
	Screens		CD 3/4
	Bins		CD 3/4 & 64
	Loadout		CD 8
Hydrated Lime Systems (Hydrating Systems 1-4)	Feeder	Feeder	CD 13
	Handling, storage and loadout	Conveyors	CD 14 & 15
		Bins	CD 15, 18, 19 & 20
		Air Separators	CD 17
		Truck Loadouts	CD 18 & 19
	Processing	Crusher	CD 15
		Screen	CD 17
Mill			
Hydration	Hydrator	CD 16	
Loadout Systems	Rail Loadout		CD 61
	Barge Loadout		CD 65
Off-Specification Lime			
Transfer and Loadout of Off-Specification Lime	Elevator		CD 1 & 2
	Feeder		
	Bin		
	Truck Loadout		CD 8
Kiln Dust			
Kiln Dust Handling	Screw and Pneumatic Conveyors		CD 5
	Bin		
	Loadout		

#### 2.3.3-1 Applicability Provisions

- a. The "affected units" for the purpose of these unit-specific conditions are the emission units described in Conditions 2.3.1 and 2.3.2.

#### 2.3.3-2 Control Technology Determination

- a. Emissions of PM from the affected units shall be controlled by enclosure and filter systems.
- b.
  - i. There shall be no visible emissions of fugitive PM, as determined by USEPA Method 22, from the affected units.
  - ii. The PM emissions from each stack or control device for affected units shall not exceed 0.0002 gr/scf, as measured by Method 5, and shall not exhibit more than 7 percent opacity as measured by Method 9, with observations conducted in accordance with 40 CFR 63.7112(k) or (l).
- c. Emissions of fugitive PM from product loadout shall be controlled by partial enclosure, a fabric filter to treat displaced air during loadout, and loadout practices to minimize spillage.
- d. There shall be no visible emissions of particulate from the transfer of kiln dust, as determined by Method 22.

#### 2.3.3-3 State Emission Standards

- a. The emissions of particulate from the affected units shall comply with 35 IAC 212.123 and 212.301. (Refer to Conditions 1.5(a) and (b).)
- b. The emissions of particulate, as would be measured by Method 5, from affected units shall comply with 35 IAC 212.321. (Refer to Condition 3.1(a).)

#### 2.3.4 Non-Applicability Provisions

None

#### 2.3.5 Operational and Production Limits and Work Practices

- a. Any spills of material from the affected units shall be immediately collected or otherwise handled in a manner that prevents lime from being dispersed or becoming airborne. (See also Condition 2.3.3-2(c).)
- b. The Permittee shall operate the baghouses for the affected units with a pressure drop that is within a range that is consistent with manufacturer's recommended levels or that during emission testing that demonstrated compliance with applicable requirements.

2.3.6 Emission Limitations

- a. Emissions from the affected units shall not exceed the following limits:

Emission Units (by associated baghouse)	Limit					
	PM		PM <sub>10</sub>		PM <sub>2.5</sub>	
	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr	Lb/Hr	Ton/Yr
CD 1/CD 2	0.039	0.171	0.005	0.022	0.002	0.011
CD 3/CD 4	0.113	0.496	0.033	0.145	0.011	0.049
CD 5	0.011	0.049	0.070	0.307	0.004	0.002
CD 8	0.495	2.168	0.450	1.971	0.221	0.966
CD 13	0.187	0.819	0.103	0.451	0.003	0.014
CD 14	0.327	1.433	0.180	0.788	0.090	0.394
CD 15	0.515	2.258	0.284	1.242	0.142	0.621
CD 16	1.966	8.609	1.081	4.735	0.005	0.024
CD 17	0.126	0.550	0.069	0.302	0.035	0.154
CD 18	0.727	3.185	0.300	1.314	0.150	0.657
CD 19	1.091	4.778	0.300	1.314	0.150	0.657
CD 20	0.364	1.593	0.200	0.876	0.100	0.438
CD 61	0.322	1.411	0.288	1.260	0.144	0.630
CD 62/CD63	0.014	0.064	0.008	0.036	0.004	0.018
CD 64	0.076	0.332	0.028	0.123	0.006	0.025
CD 65	0.315	1.379	0.284	1.242	0.142	0.621
Total		29.30		16.13		5.28

2.3.7 Testing Requirements for Affected Units

- a. The Permittee shall conduct opacity observations for each affected unit in accordance with Condition 3.2:
- i. No later than 45 days after the date initial emission testing of the affected kiln is performed, as required by Condition 2.1.7(a) (i), if visible emissions are normally observed from the exhaust from the fabric filters.
  - ii. Upon written request by the Illinois EPA, in which case observations shall be conducted within 45 days or such later date specified by the Illinois EPA.
- b. Within 90 days of a written request from the Illinois EPA, the Permittee shall have the PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions at the stacks or vents of the affected units, as specified in such request, measured during representative operating conditions. Testing shall be conducted in accordance with the procedures and method specified in Condition 3.1 using USEPA test methods and procedures.

2.3.8 Inspection Requirements

- a. The Permittee shall conduct inspections of the affected units on at least a monthly basis with supervisory personnel or other personnel who are not engaged in running the affected units on

a day-to-day basis for the specific purpose of verifying that measures required to control emissions are being properly implemented.

- b. The Permittee shall keep records documenting the performance of these inspections and their findings.

#### 2.3.9 Recordkeeping Requirements

- a. The Permittee shall maintain files, which shall be kept current, that contain:
  - i. For each fabric filter or other filter devices associated with the affected units, design specifications for each device (type of unit, maximum design exhaust flow (acfm or scfm), filter area, type of filter cleaning, performance guarantee for particulate exhaust loading (gr/scf), the manufacturer's recommended operating and maintenance procedures for the device, and design specification for the filter material in each device (type of material, surface treatment(s) applied to material, weight, performance guarantee, warranty provisions, etc.).
  - ii. For each fabric filter, the normal range of pressure drop across the device and the minimum and maximum safe pressure drop for the device, with supporting documentation.
- b. The Permittee shall maintain written work procedures for the affected units.
- c. The Permittee shall maintain the following logs or other records for the affected units:
  - i. Operating log(s), in accordance with Condition 3.3(a), which records shall include information addressing any incidents when lime was spilled.
  - ii. Inspection, maintenance and repair log(s) or other records in accordance with Condition 3.3(b).
- d. The Permittee shall maintain records of the following items related to emissions of the affected units:
  - i. A file containing the standard emission factors used by the Permittee for estimating controlled emissions from the affected unit, which information shall be based on site-specific test data, representative test data or emission determination methodology published by USEPA, with supporting explanation and calculations.
  - ii. Records of emissions of PM, PM<sub>10</sub>, and PM<sub>2.5</sub>, (tons/month and tons/year), with supporting calculations.

### 2.3.10 Reporting Requirements

- a. The Permittee shall promptly notify the Illinois EPA of any deviations from the requirements of this permit for the affected units as follows. These notifications shall include the information specified by Condition 3.4.
  - i. If the affected unit is damaged so there is a deviation from applicable requirements for visible emissions that is not repaired or otherwise corrected within 1 hour (60 minutes), the Permittee shall notify the Illinois EPA within 30 days.
  - ii. The deviations addressed above and all other deviations shall be reported with the periodic compliance reports required by Condition 2.1.10(c).

### 2.3.11 Flexibility

The Permittee is authorized, as follows, to construct and operate affected units that differ from those described in the application without obtaining further approval by the Illinois EPA. This condition does not affect the Permittee's obligation to comply with all applicable requirements for affected units:

- a. This authorization only extends to changes that result from the detailed design of the plant and any refinements to that design of the affected units that occur during construction and the initial operation of the plant.
- b. With respect to air quality impacts, these changes shall generally act to improve dispersion and reduce impacts, as emissions from individual units are lowered, units are moved apart or away from the fence line, stack heights are increased, and heights of nearby structures are reduced.
- c. The Permittee shall notify the Illinois EPA prior to proceeding with any changes. In this notification, the Permittee shall describe the proposed changes and explain why the proposed changes will act to reduce impacts, with detailed supporting documentation.
- d. Upon written request by the Illinois EPA, the Permittee shall promptly have air quality dispersion modeling performed to demonstrate that the overall effect of the changes is to reduce air quality impacts, so that impacts from affected units remain at or below those predicted by the air quality analysis accompanying the application.

## 2.4 Unit-Specific Conditions for Storage Piles and Roadways

### 2.4.1 Description

Crushed limestone and solid fuel will be stored at the plant in stockpiles. Fugitive dust or particulate emissions will be minimized by implementation of a fugitive dust control program.

Fugitive dust or particulate emissions will also be generated by vehicle traffic and wind erosion on roadways, parking areas and access areas at the plant. These emissions are controlled by implementation of a fugitive dust control program to minimize the generation of emissions.

### 2.4.2 List of Emission Units and Pollution Control Equipment

Emission Unit	Description	Emission Control
Storage Piles	Limestone and Fuel Storage	Fugitive Dust Control Program
Roadways and Parking Areas	PM emissions from vehicle traffic and wind erosion on roadways and parking areas	Fugitive Dust Control Program

### 2.4.3-1 Applicability Provisions

- a. The affected storage piles for the purpose of these unit-specific conditions are the storage piles described in Condition 2.4.1 and 2.4.2.
- b. The affected roadways and parking areas for the purpose of these unit-specific conditions are the areas described in Conditions 2.4.1 and 2.4.2.

### 2.4.3-2 Control Technology Determination

- a. The opacity of PM emissions from affected units shall not exceed 10 percent. For this purpose, opacity shall be determined in accordance with 35 IAC 212.109.
- b. Emissions of PM from affected roadways and parking area shall be controlled by implementation of a fugitive dust control program that provides for water spraying or application of dust suppressant for units that are not paved and vacuum sweeping or water flushing for units that are paved, which activities shall be performed on an appropriate schedule when a roadway or area is in use unless significant precipitation has occurred during the previous 24 hours or there is snow or ice buildup on the roadway or area.

### 2.4.3-3 Applicable State Regulations

- a. The particulate matter emission from the affected units shall comply with the standards in 35 IAC 212.123 and 212.301. (Refer to Condition 1.3)

2.4.4 Non-Applicability of Regulations of Concern

- a. The affected units are not subject to the requirements of 35 IAC 212.321 pursuant to 35 IAC 212.323.

2.4.5 Work Practices

- a. The Permittee shall follow good air pollution control practices to minimize PM emissions from affected roadways and parking area. These practices shall provide for paved run out areas for all regularly traveled entrances and exits from the source, and treatment (e.g., watering, dust suppressant application, vacuum sweeping, and/or flushing) of all affected units on which routine truck traffic is occurring for very effective and effective control of dust, respectively (nominal 90 percent for paved units and 75 percent control for other units).
- b. The Permittee shall carry out control measures for PM emissions from affected roadways and parking area in accordance with a written control program maintained by the Permittee, which shall set forth the measures being implemented to demonstrate compliance with Conditions 2.4.3-2 and 2.4.5(a). This program shall include: (1) a description of the emissions control technique(s) (e.g., vacuuming or sweeping) that will routinely be implemented; (2) triggers for implementation of additional control, e.g., observation of extended dust plumes following passage of vehicles; and (3) the estimated effectiveness of the various control techniques in reducing PM emissions from the different classes of units, with supporting documentation.

2.4.6 Emission Limitations

- a. Emissions of PM, PM<sub>10</sub>, and PM<sub>2.5</sub> from the affected units shall not exceed the following limits.

Emission Units	Limit (Tons/Yr)		
	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Limestone Storage Piles (EP03, EP66 and EP67)	3.60	1.80	0.27
Coke/coal Storage Piles (EP37)	1.12	0.56	0.09
Roadways and Parking Areas	7.70	2.20	0.22
Total	12.42	4.56	0.58

- b. Compliance with these limits shall be determined from the amount and type of material stored in storage piles at the plant, the amount and type of vehicle traffic for the plant, appropriate emission factors and engineering calculations with appropriate USEPA methodology for estimating emissions of fugitive dust from storage piles and roads and open areas.

2.4.7 Opacity Observations

The Permittee shall conduct opacity observations for the affected units in accordance with Condition 3.2:

- a. No later than 45 days after the date initial emission testing of the kilns is performed, as required by Condition 2.1.7.
- b. Upon written request by the Illinois EPA, in which case observations shall be conducted within 45 days or such later date specified by the Illinois EPA.

#### 2.4.8-1 Inspections

- a. The Permittee shall conduct inspections of the affected units on a monthly basis with personnel who do not implement the control program on a day-to-day basis for the specific purpose of verifying that the measures identified in the program and other measures required to control emissions from affected units are being properly implemented.
- b. On at least a quarterly basis, these inspections shall include observations of the opacity of PM emissions from affected units by individual who are certified observers for Method 9.
- c. The Permittee shall keep records documenting the performance of these inspections and their findings.

#### 2.4.8-2 Measurements of Silt Loading

The Permittee shall conduct measurements of the silt loading on affected roadways and parking areas, as follows:

- a. Sampling and analysis of the silt loading on representative road segments shall be conducted using the appropriate provisions in the "Procedures for Sampling Surface/Bulk Dust Loading," Appendix C.1 in Compilation of Air Pollutant Emission Factors, USEPA, AP-42. A series of samples shall be taken to determine the average silt loading and address the change in silt loadings as related to the amount and nature of vehicle traffic. For this purpose, sampling shall not be conducted only immediately after treatment of roadways but shall either be conducted so to obtain representative data for the silt loadings on roadways.
- b. Measurements shall be performed by the following dates:
  - i. Measurements shall first be completed in conjunction with emission testing for the lime kiln no later than 45 days after conducting emissions testing of the kiln pursuant to Condition 2.1.7-1(a)(i).
  - ii. Measurements shall be repeated within 30 days in the event of changes involving affected units that would act to increase the silt loading (so that data that is representative of the current circumstances of the affected units has not been collected), including changes in the amount or type of traffic on affected units, changes in standard operating practices for affected units, such as application of traction material during

cold weather, and changes in the operating program for affected units.

- iii. Upon written request by the Illinois EPA, the Permittee shall conduct measurements, as specified in the request, which shall be completed within 75 days of the Illinois EPA's request.
- c. The Permittee shall submit test plans, test notifications and test reports for these measurements as specified by Condition 3.1(d), (e) and (f) provided, however, that once a test plan has been accepted by the Illinois EPA, a new test plan need not be submitted if the accepted plan will be followed or a new test plan is requested by the Illinois EPA.

#### 2.4.9 Recordkeeping Requirements

- a. The Permittee shall maintain a file containing:
  - i. The Permittee's assumptions, with supporting explanation, for the typical and maximum quantity and nature of vehicle traffic for the affected units, including truck traffic related to the receipt of fuel and shipment of lime from the plant.
  - ii. The maximum PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions from the affected units (tons/year), with supporting calculations, based on the maximum vehicle traffic at the plant (as recorded above), the silt loading on the different classes of affected units (as measured pursuant to Condition 2.4.8-2), and the effectiveness of the current fugitive dust control program (as addressed in Condition 2.4.5(a)).
- b.
  - i. The Permittee shall maintain a written fugitive dust control program describing the measures that are being implemented pursuant to Conditions 2.4.3-2 and 2.4.5 to control PM emissions from affected units. This program shall identify established control measures (e.g., water spray, surfactant spray, vacuum sweeping or water flushing); details of standard treatments (speed of treatment vehicle, flow of water, width of application, and additive concentration); normal frequency with which measures would be implemented; circumstances, e.g., recent precipitation, in which the measure would not be implemented; triggers for additional control, e.g., observation of 8 percent opacity; and calculated control efficiency, with supporting calculations.
  - ii. The program shall be accompanied by maps or diagrams indicating the location of affected units with the potential to generate for PM emissions, with description (length, width, surface material, etc.) and volume and nature of expected traffic or other activity.

- iii. The Permittee shall submit a copy of a revised fugitive dust control program to the Illinois EPA for review and approval within 90 days of a request from the Illinois EPA for a revision to the program to address observed deficiencies in the control program.
- c. The Permittee shall maintain records of the amount of bulk materials received and shipped from the plant by truck (tons, by type of material).
- d. The Permittee shall maintain documenting the implementation of the dust control program for the affected units including:
  - i. Records for treatment of affected units, including the date and time; the reason for treatment, if not routine; the type of treatment; the identity of the treatment vehicle or equipment; and a description of any unusual observations or events related to control of dust that occurring during treatment; and
  - ii. Detailed records for incidents when control measures were not carried out as scheduled or were not fully implemented and incidents when additional control measures were carried out, with a description of each such incident and explanation, including the information specified in Condition 3.4(a), and an estimate of the additional PM emissions that resulted, if any, with supporting calculations. These records shall also address any adjustments to the scheduling of control measures made by the Permittee due to weather conditions that either acted to reduce or increase the level of potential dust, such as extended periods of dry weather.
- e. The Permittee shall maintain records for the PM, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions of the affected units on at least an annual basis to verify compliance with the limit in Condition 2.4.6, based on operating data for the source, the above records for the affected units including data for implementation of the operating program, and appropriate USEPA emission estimation methodology and emission factors, with supporting calculations.

#### 2.4.10 Notification and Reporting Requirements

- a. The Permittee shall promptly notify the Illinois EPA of any deviations from the requirements of this permit for the affected units as follows. These notifications shall include the information specified by Condition 3.4.
  - i. If the availability of treatment for the affected units is interrupted for 5 or more days and there is a deviation from applicable requirements for the affected units, the Permittee shall notify the Illinois EPA within 30 days.

- ii. The deviations addressed above and all other deviations shall be reported with the periodic compliance reports required by Condition 2.1.10(c).

SECTION 3: GENERAL CONDITIONS

3.1 Emission Testing Requirements

a. Emissions testing shall be conducted by an approved testing service at the expense of the Permittee. Unless otherwise specified by this permit or a request from the Illinois EPA for the performance of emission testing, emission testing shall be conducted while affected unit(s) are operating at maximum rate(s) and during other representative operating conditions of the unit(s) and associated control system(s).

b. i. USEPA test methods and procedures shall be used for measurement of emissions, including the following methods, unless other established methods are specified in unit-specific condition of this permit or are approved by the Illinois EPA as part of the approval of a test plan. Refer to 40 CFR 51, Appendix M, 40 CFR 60, Appendix A and 40 CFR 63, Appendix A for USEPA test methods.

NO <sub>x</sub>	Method 7 or 7E <sup>a</sup>
CO	Method 10 <sup>a</sup>
VOM	Method 18 <sup>b</sup> and either 25 or 25A <sup>c</sup>
PM (filterable)	Method 5 <sup>d</sup>
PM (condensable)	Method 202 or Conditional Method 039
PM <sub>10</sub> (filterable)	Method 201A or 201B
PM <sub>2.5</sub> (filterable)	Method 201A
PM <sub>2.5</sub> (condensable)	Method 202
Sulfuric Acid Mist	Method NCASI 8a (Controlled Condensation)
Hydrogen Chloride	Method 26 or ASTM-E 224-08
Lead and Other Metals	Method 29

Notes:

- a. Test method provided if testing of the kiln is required and continuous emissions monitoring is not required.
- b. Methane, ethane and other exempt compounds may be excluded from the results of VOM emission testing for emission unit(s) provided that Method 18, or other appropriate test procedure identified in the test plan approved by the Illinois EPA, is used to quantify and adjust for the presence of such compounds in the exhaust from the unit(s).
- c. Method 25 shall be used to measure emissions of VOM unless the concentration of organic compounds in the exhaust stream from a unit is less than 50 ppmv.

- d. During measurements of emissions, observations of opacity shall also be conducted in accordance with USEPA Method 9 if the opacity of the exhaust is not monitoring during testing.
- ii. PM<sub>10</sub> tests shall include measurements of condensable particulate, as collected in the back half of the Method 5 sampling train or by separate measurements using USEPA Method 202 (40 CFR Part 51, Appendix M). For units for which the average stack gas temperature is less than 250 °F, such as the lime handling systems, testing may be conducted at actual stack gas temperature without heating of the probe or filter holders.
- c. For purposes of determining compliance of the affected units with the NESHAP standard pursuant to 40 CFR 63.7112:
  - i. The emission tests for the affected kilns and affected limestone handling operations that are subject to the requirements of NESHAP, Subpart AAAAA shall be conducted in accordance with Table 4 of this NESHAP (as applicable) using the test methods and procedures specified in 40 CFR 63.7(e)(1) and under conditions specified in Table 4.
  - d. The Permittee shall submit a written test plan to the Illinois EPA for review and approval for initial testing of an emission unit and if a significant change in the procedures for testing is planned from the procedures followed in the previous testing of an emission unit. This plan shall be submitted at least 60 days prior to the actual date of testing and include the following information as a minimum:
    - i. A description of the planned emission test.
    - ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.
    - ii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of the maximum emissions, the levels of operating parameters at or within which compliance is intended to be shown, if parameters for the process and any control equipment will be determined.
    - iii. The specific determination of emissions and operations intended to be made, including sampling and monitoring locations.
    - iv. The test methods that will be used, with the specific analysis method.
    - v. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.

- vi. A statement that the testing will be performed by a qualified independent testing service.
- e.
  - i. Prior to carrying out emission tests, the Permittee shall notify the Illinois EPA a minimum of 30 days prior to the scheduled date of these tests with the exact date, time and place of these tests, to enable the Illinois EPA to witness these tests.
  - ii. If the scheduled date for the test is changed, the Permittee shall inform the Illinois EPA within 5 working days of the scheduled test date and must specify the date and time of the rescheduled test.
  - iii. Notwithstanding the above, the Illinois EPA may at its discretion accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.
- f. The Permittee shall submit three copies of the Final Report(s) for emissions tests to the Illinois EPA no later than 60 days after completion of sampling. The Final Report shall include as a minimum:
  - i. Information required pursuant to 40 CFR 63.7112(h).
  - ii. General information, i.e., date of test, names of testing personnel, and names of Illinois EPA observers.
  - iii. A summary of the measured emissions of different pollutants in pounds per hour and other appropriate terms, e.g., lbs/ton, lbs/ton, gr/dscf or ppmv.
  - iv. A statement whether compliance was demonstrated
  - v. A detailed description of operating conditions of the emission unit(s) during testing, including:
    - A. Process information, e.g., type or product and operating rate.
    - B. Control system operating parameters during testing.
  - vi. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule.
  - vii. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.
  - viii. Conclusions.

- g. The Permittee shall retain copies of emission test reports for at least five years after the date that an emission test is superseded by a more recent test.

### 3.2 Opacity Observations

- a. Upon written request by the Illinois EPA, the Permittee shall conduct opacity observations for specific affected unit(s) or unit(s) within 45 calendar days of the request or on the date agreed upon by the Illinois EPA, whichever is later.
- b. Opacity of emissions shall be determined during representative weather and operating conditions by a qualified observer in accordance with USEPA Test Method 9 and in a manner consistent with 40 CFR 60.675 and 63.7121, as further specified below.
- c. The duration of opacity observations for each test shall, unless directed otherwise by applicable underlying state rule be at least 30 minutes (five 6-minute averages) unless the average opacities for the first 12 minutes of observations (two six-minute averages) are both no more than half of the most stringent requirement applying to opacity.
- d.
  - i. The Permittee shall notify the Illinois EPA at least 7 days in advance of the date and time of these tests, in order to allow the Illinois EPA to witness testing. This notification shall include the name and employer of the qualified observer(s).
  - ii. The Permittee shall promptly notify the Illinois EPA of any changes in the time or date for testing.
- e. The Permittee shall provide a copy of its observer's readings to the Illinois EPA at the time of testing, if Illinois EPA personnel are present.
- f. The Permittee shall submit a written report for this testing within 15 days of the date of testing. This report shall include:
  - i. Date and time of testing.
  - ii. Name and employer of qualified observer, with a copy of his or her current certification.
  - iii. Description of observation condition, including recent weather.
  - iv. Description of the operating conditions of the affected unit.
  - v. Opacity determinations, accompanied by raw data.
  - vi. Conclusions.

- g. The Permittee shall retain copies of opacity test reports for at least five years after the date that an opacity test is superseded by a more recent test.

### 3.3 General Requirements for "Logs" Or Similar Records

- a. Operating logs or other similar records required by this permit shall, at a minimum, include the following information related to the emission units and associated control system:
  - i. Information identifying periods when an emission unit or group of related emission units was not in service.
  - ii. For periods when a unit or group of related units is in service and operating normally, relevant process and control system information to generally confirm normal operation.
  - iii. For periods when a unit or group of related units is in service and is not operating normally, identification of each such period, with detailed information describing the operation of the unit(s), the potential consequences for additional emissions from the unit(s), the potential of any excess emissions from the affected unit(s), the actions taken to restore normal operation, and any actions taken to prevent similar events in the future.
  - iv. Other information as may be appropriate to show that the emission unit or group of related emission units is operated in accordance with good air pollution control practices.
- b. Inspection, maintenance and repair logs or other similar information required by this permit shall, at a minimum, include the following information related to the emission units and associated control system:
  - i. Identification of equipment, with date, time, responsible employee and type of activity.
  - ii. For inspections, a description of the inspection, findings, and any recommended actions, with reason.
  - iii. For maintenance and repair activity, a description of actions taken, reason for action, e.g., preventative measure or corrective action as a result of inspection, probable cause for requiring maintenance or repair if not routine or preventative, and the condition of equipment following completion of the activity.
  - iv. Other information as may be appropriate to show that the emission unit or group of related emission units is maintained in accordance with good air pollution control practices, including prompt repair of defects that interfere with effective control of emissions.

- c. The logs required by this permit may be kept in manual or electronic form, and may be part of a larger information database maintained by the Permittee provided that the information required to be kept in a log is readily accessible.

#### 3.4 Reporting of Deviations

- a. Reports of deviations shall include the following information:
  - i. Identity of the deviation, with date, time, duration and description.
  - ii. Describe the effect of the deviation on compliance, with an estimate of the excess emissions that accompanied the deviation, if any.
  - iii. Describe the probable cause of the deviation and any corrective actions or preventive measures taken.
- b. Semi-Annual compliance report shall be submitted no later than 45 days after the preceding period. This report shall also provide a listing of all deviations for which immediate or 30-day reporting was required, but need not include copies of the previously submitted information.
- c.
  - i. Unless otherwise specified in a particular condition of this permit, if deviation(s) from requirements of this permit occurs during a reporting period, compliance report shall be submitted no later than 30 days after the end of the reporting period. This report shall also provide a listing of all deviations for which immediate or 30-day reporting was required, but need not include copies of the previously submitted information.
  - ii. If there are no deviations during a reporting period, the Permittee shall still submit a compliance report, which report shall state that no deviations occurred during the reporting period.
- d.
  - i. For the purpose of determining whether a deviation must be reported prior to a periodic compliance report, a deviation shall be considered to continue even if operation of an emission unit is interrupted if the deviation is still present when operation of the unit is resumed.
  - ii. When this permit requires immediate notification, such notification shall be provided by telephone and followed by facsimile or e-mail transmittal of a narrative report.
- e. Notwithstanding the above provisions or provisions in the Unit Specific Conditions of this permit for reporting deviations, if deviation will occur from required maintenance, repair or other activity that can be scheduled in advance, the Permittee shall

also notify the Illinois EPA prior to undertaking such activity, if it is feasible to do so. Such notification shall be submitted at least 5 days in advance unless the activity is scheduled less than 5 days in advance. Such notification shall be followed by such other notification or reporting as required for the deviations.

ATTACHMENT 1

Annual Emission of the Lime Plant (Tons/Year)

Operations	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM	PM <sub>10</sub> <sup>1</sup>	PM <sub>2.5</sub> <sup>1</sup>	VOM
Kilns	283	1,533	1,095	62.00	84.50	45.90	22.0
Handling of Limestone and Solid Fuel	---	---	---	3.06	1.12	0.08	---
Lime Processing and Handling	---	---	---	29.30	16.13	5.28	---
Storage Piles and Roadways	---	---	---	12.42	4.56	0.58	---
Total	283	1,533	1,095	106.78	106.31	51.84	22.0

Notes

1. Total particulate emissions, including both filterable and condensable particulate.

ATTACHMENT 2

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS  
ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.
2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act and Regulations adopted by the Illinois Pollution Control Board.
3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Illinois EPA and a supplemental written permit issued.
4. The Permittee shall allow any duly authorized agent of the Illinois EPA upon the presentation of credentials, at reasonable times:
  - a. To enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,
  - b. To have access to and to copy any records required to be kept under the terms and conditions of this permit,
  - c. To inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,
  - d. To obtain and remove samples of any discharge or emissions of pollutants, and
  - e. To enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:
  - a. Shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located;
  - b. Does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities;
  - c. Does not release the Permittee from compliance with other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations;
  - d. Does not take into consideration or attest to the structural stability of any units or parts of the project; and
  - e. In no manner implies or suggests that the Illinois EPA (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.
- 6a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Illinois EPA before the equipment covered by this permit is placed into operation.
- b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.
7. The Illinois EPA may file a complaint with the Board for modification, suspension or revocation of a permit.
  - a. Upon discovery that the permit application contained misrepresentations, misinformation or false statement or that all relevant facts were not disclosed, or
  - b. Upon finding that any standard or special conditions have been violated, or
  - c. Upon any violations of the Environmental Protection Act or any regulation effective there under as a result of the construction or development authorized by this permit.

July, 1985, Revised, May, 1999

Illinois Environmental Protection Agency  
Bureau of Air, Permit Section  
1021 N. Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9276

Project Summary for an Application for  
Construction Permit/PSD Approval from  
Mississippi Lime Company for a  
Lime Manufacturing Plant in Prairie Du Rocher, Illinois

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

Schedule

Public Comment Period Begins: October 4, 2010  
Public Hearing: November 18, 2010  
Public Comment Period Closes: December 18, 2010

Illinois EPA Contacts

Permit Analyst: Minesh Patel  
Community Relations Coordinator: Brad Frost

## I. INTRODUCTION

Mississippi Lime Company (Mississippi Lime) has applied for an air pollution control construction permit for a lime manufacturing plant at its existing limestone mine located in Prairie Du Rocher. Mississippi Lime proposes to construct a plant that would include two pre-heater rotary kilns; limestone crushing, storage and handling; fuel storage and handling; lime hydrators; lime storage, handling, and loadout; and other ancillary operations.

The Illinois EPA has reviewed Mississippi Lime's application for a construction permit and made a preliminary determination that the application meets applicable requirements. Accordingly, the Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the proposed construction of lime plant. However, before issuing the permit, the Illinois EPA is holding a public comment period and a public hearing to receive comments on the proposed issuance of a permit and the terms and conditions of the draft permit.

## II. BACKGROUND

Lime is manufactured in kilns by high-temperature roasting or "calcination" of limestone or other material rich in calcium carbonate to convert calcium carbonate ( $\text{CaCO}_3$ ) into lime or calcium oxide ( $\text{CaO}$ ).

Lime is commonly manufactured in rotary kilns. A rotary kiln is a long, cylindrical, horizontal furnace, lined with refractory, through which the limestone and combustion gases pass in opposite directions, in counter-current flow. The kiln is slightly inclined, with stone feed going in at the higher end and lime product coming out at the lower end, where the burner is located. The heating of the limestone is facilitated by rotation of the kiln about its horizontal axis.

The kiln is the principal source of emissions at a lime manufacturing plant. The kiln emits dust or particulate matter (PM), which is generated from the limestone as it moves through the kiln and is calcined and from ash and particulate released by combustion of fuel. This particulate must be controlled by water scrubbing or filtration. Lime kilns also emit sulfur dioxide ( $\text{SO}_2$ ) due to the sulfur contained in the fuel burned in the kiln and in the limestone feedstock. The  $\text{SO}_2$  emissions are controlled by inherent adsorption on particulate emissions and the particulate control device. This control may be supplemented by equipment to specifically enhance control of  $\text{SO}_2$ . Lime kilns also emit nitrogen oxide ( $\text{NO}_x$ ), which is formed in a kiln when nitrogen and oxygen in the combustion air combine during combustion of fuel. The  $\text{NO}_x$  emissions of lime kilns are minimized by the design of the burner and combustion system of the kilns. Finally, lime kilns emit carbon monoxide (CO) and volatile organic material (VOM), which are products of incomplete combustion of fuel and the organic matter present in the limestone. These are minimized by good combustion practices.

The other emission units at lime manufacturing plant beside the kilns involve (1) the handling of and preparation of the raw limestone to be

fed to the kilns by crushing and sizing of the limestone (also known as "processed stone handling"), (2) the handling and processing of the lime product from the kilns, (3) the handling of solid fuel for the kilns, and (4) plant roadways, with vehicle traffic. These units emit particulate, which is controlled by measures to reduce the generation of emissions and measure to control emissions that are released.

### III. PROJECT

Mississippi Lime has applied for a construction permit for a lime manufacturing plant with two rotary kilns that would burn coal and petroleum coke, i.e., solid fuel. The lime produced by the kilns would be cooled in a integral cooler that would recover heat to dry and preheat the fuel. Each kiln would have a preheater at the exhaust end of the kiln, before the add-on air pollution control. The preheater would heat the stone feed that will go into the kiln using the thermal energy contained in the hot flue gas from the kiln. The use of preheaters will lower the amount of fuel that is needed to make lime, in Btu per ton, increasing the energy or fuel efficiency of the kilns.

The emissions of the kilns would be controlled by a combination of design, work practices and add-on emission control equipment. Emissions of NO<sub>x</sub>, CO and VOM would be controlled by the design of the kilns and low excess air and good combustion practices. PM emissions would be controlled by add-on baghouses or fabric filters. SO<sub>2</sub> emissions would be controlled by the natural ability of limestone and lime dust to absorb SO<sub>2</sub>, with SO<sub>2</sub> then being removed from the flue gas in the dust collected by the fabric filters. As the plant would produce high-calcium lime, this would provide very effective control of SO<sub>2</sub> emissions.

The limestone processed at the proposed plant is expected to come by an enclosed transfer system from an associated underground mine facility, which is owned by Mississippi Lime, and crushed to final size at the plant. Alternatively, limestone may be received by truck from an off-site quarry. The associated mine facility at the plant site is currently operated by Martin Marietta Materials under a lease that is set to expire in October 2010 (Illinois EPA Source ID. No.: 157863AAB). Mississippi Lime plans to take over operation of this facility and operate it to supply limestone to local markets on an interim basis until the proposed lime plant is operational. For this purpose, Mississippi Lime has obtained a permit to install its own limestone crushing plant at the mine facility (Construction/Operating Permit No. 10050062). When the proposed plant begins operation, units at this limestone crushing plant that are addressed by this construction permit would continue in operation. Other units that are not addressed by this permit would cease operation.

At the proposed plant, the crushed limestone will be stored in stockpile. Limestone from the storage pile will be screened to remove material that is too small or large from the limestone that is fed to the kilns. Appropriately sized material will go to bins pending feed to the kilns. Unsuitable material will be stockpiled pending loadout for alternative use. Solid fuel for the kilns will also be handled at the plant. Solid fuel will also be stored in stockpiles. From the

stockpiles, fuel be transferred to the fuel feed bins for the kilns. The particulate emissions from these operations will be minimized by the nature of the materials, including moisture content, enclosure and work practices.

The raw lime product from the kilns must be screened to size the product lime. Some of the lime from the kilns, which is quick lime (CaO), would be converted to hydrated lime (Ca(OH<sub>2</sub>)) by adding water in a hydration system. Kiln dust, i.e., lime and limestone dust collected by the baghouses on the kilns, will also be handled pending final disposition. The particulate emissions from these operations equipment will be controlled by a combination of work practices and fabric filters (baghouses).

Fugitive dust or particulate emissions will also be generated by vehicle traffic and wind erosion on roadways, parking areas and access areas at the plant. These emissions are controlled by implementation of a dust control program to minimize the generation of emissions.

#### IV. EMISSIONS

A summary of the permitted or potential emissions of the lime plant as would be allowed by the draft permit on an annual basis are provided below. In practice, the actual emissions from the plant should be less than the permitted emissions as units operate at less than their maximum capacity and emission rates are normally lower than the applicable standards and limitations.

##### Summary of Permitted Annual Emissions of the Lime Plant (Tons/Year)

Pollutant	Permitted Emissions
NO <sub>x</sub>	1,533
CO	1,095
SO <sub>2</sub>	283
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	107/107/52.3
VOM	22

#### V. APPLICABLE EMISSION STANDARDS

All emission units in Illinois are subject to state emission standards adopted by the Illinois Pollution Control Board. These standards specify the maximum rate or concentration of a pollutant that may be emitted from a unit or certain minimum control requirements must be achieved. The state standards represent the minimum requirement for emission units in Illinois. 35 IAC 212.321 addresses PM emissions from process emission units, including lime kilns and other operations at lime plants, setting limits on hourly emissions based on the amount of material processed by a unit. These standards are less stringent than applicable federal emission standards adopted by USEPA and the emission limitations that would be set by the permit for the plant.

USEPA has adopted emission standards called New Source Performance Standards (NSPS) for various categories of emission units. The proposed kilns are subject to the NSPS for lime manufacturing plants, 40 CFR 60, Subpart HH. This NSPS sets standards for the particulate emissions and opacity from lime kilns, i.e., 0.60 pounds of PM per ton of limestone feed and 15 percent opacity (40 CFR 60.342).

USEPA has also adopted emission standards called federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for various categories of emission units. The lime kiln is subject to the NESHAP for lime manufacturing plants, 40 CFR 63, Subpart AAAAA. This NESHAP sets a standard for particulate emissions of lime kilns, i.e., 0.10 pound per ton of limestone feed (40 CFR 63.7090). It also sets standards for the handling of limestone or "processed stone handling operations" at a lime manufacturing plant, limiting stack emissions of particulate matter to no more than 0.032 gram per cubic meter, the opacity of uncaptured particulate emissions to 7 percent, and the opacity of fugitive emissions to no more than 12 percent

#### VI. APPLICABILITY OF REQUIREMENTS FOR MAJOR PROJECTS

Construction of a project that results in a significant increase in emissions at an existing major source or that would by itself be a major source is subject to additional requirements pursuant to the "New Source Review (NSR)." In an area that is attainment for a criteria air pollutant (i.e., meeting the ambient air quality standards), the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21, apply. Prairie Du Rocher is in the portion of Randolph County, an area that is classified as attainment for all criteria pollutants.<sup>1</sup>

The PSD rules were established to preserve clean air. The PSD rules require: 1) an "emission limit" on new or modified equipment which represents Best Available Control Technology (BACT), 2) an air quality assessment of the impact of new emissions, and 3) an analysis of impacts on soils, vegetation, and visibility. The Illinois EPA has been delegated authority by USEPA to administer the PSD permit program in Illinois.

Mississippi Lime's proposed lime manufacturing plant is subject to PSD for emissions of SO<sub>2</sub>, NO<sub>x</sub> and CO because the potential emissions of the plant are more than 100 tons/year. The plant is also subject to PSD for particulate emission because its potential emissions of particulate, as particulate matter (PM), PM<sub>10</sub> and PM<sub>2.5</sub> are more than the significant emission rates set for particulate emissions by the PSD rules.<sup>2</sup> As Mississippi Lime has applied for a permit with potential emission for the plant exceeding the major source threshold for certain pollutants, the application must be appropriately reviewed under the

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1. Baldwin Township in Randolph County is designated nonattainment for PM<sub>2.5</sub> air quality.

2. Under the PSD rules, 40 CFR 52.21(b)(23), the particulate emissions of a proposed construction project are considered significant if the increase or net increase in annual emissions are equal to or greater than 10, 15 or 25 tons per year for particulate measured as PM<sub>2.5</sub>, PM<sub>10</sub> or filterable PM, respectively.

PSD rules for those pollutants. The potential emissions of the lime plant for other PSD pollutant would not be significant. In particular, the potential emissions this project for VOM and sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>) are less than 40 and 7 tons per year, respectively, so that this project is not subject to PSD for these pollutants.<sup>3</sup>

#### VII. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

The Clean Air Act defines BACT as: "... an emission limitation based on the maximum degree of reduction ... which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable ...."

Mississippi Lime submitted a BACT demonstration in its application reflecting its judgment as to the emission control technology and associated emission limits that should be considered BACT under the PSD rules for various units at the plant. The BACT demonstration evaluates various technologies that could be used to control emissions of different pollutants. It also includes a review of the emission limits set as BACT for other lime plant projects in the country that were subject to PSD permitting.

The Illinois EPA has reviewed the material submitted by Mississippi Lime and made its independent determination of BACT. In addition to the material submitted by Mississippi Lime, the Illinois EPA's determination of BACT relies upon its general knowledge of the types of operations at the plant. As explained below, the Illinois EPA concurred with Mississippi Lime's selection of control technologies as it reflected technologies that are commonly used at lime manufacturing plants and effectively control emissions. The Illinois EPA's determination of BACT for the proposed plant, as set forth in the draft permit, would establish stringent performance requirements for the use of this control technology at the proposed plant.

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3. Even though the emissions of greenhouse gases (GHGs), including carbon dioxide (CO<sub>2</sub>), from the proposed plant would be significant, GHGs are not yet a regulated pollutant under the PSD rules. (Refer to the definition of "subject to regulation" at 40 CFR 52.21(B)(49).)

However, the proposed lime plant would be developed to minimize emissions of GHGs as it includes features to enhance fuel and energy efficiency of the kilns, notably the preheaters on each kiln. If PSD were applicable to the proposed plant for its emissions of GHGs, these preheaters would be the primary control technology specified as Best Available Control Technology (BACT) for the kiln's emissions of GHGs, which are primarily CO<sub>2</sub>. (This is addressed in Supplemental BACT Information submitted by Mississippi Lime, "BACT for GHG Emissions from Lime Kilns.")

As it is, the preheater on the kilns would 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 NO<sub>x</sub> and CO, which are linked with combustion of fuel in the lime kilns. Because the preheaters serve to reduce emissions of NO<sub>x</sub> and CO, the draft permit would set design standards for the energy efficiency of the kilns with preheaters, expressed indirectly in terms of emissions of GHGs and CO<sub>2</sub> per ton of lime product from the kilns, on an annual average basis.

## Lime Kilns

General Design of Kilns and Selection of Principle Fuel - Mississippi Lime has proposed to use an established approach to the kilns, with features, notably preheaters, to minimize emissions. It has also proposed to use commercial solid fuels, for which it can rely upon long-term availability, consistent quality, and reasonably certain future prices. These decisions are consistent with the business purpose of the proposed plant, as it is intended to process an existing reserve of high-calcium limestone owned by Mississippi Lime or, alternatively, other local reserves of limestone to make various types of high-calcium lime products for regional markets. These considerations appropriately define the scope of the proposed plant, and, among matters, eliminate use of biomass fuel as a potential alternative fuel for the plant for purposes of BACT.<sup>4, 5</sup>

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4. The use of biomass as the fuel for the proposed plant can be readily eliminated as a BACT alternative for the proposed plant. The fact that biomass fuel is used at certain facilities to produce steam and electricity does not show that it should be required at the proposed plant. Biomass fuel is not consistent with the nature of the plant, which would produce lime, a physical product, for sale. To effectively convert limestone into lime, the kilns need fuel with consistent heat content and other physical properties. This objective is inconsistent with use of biomass fuel. As a general matter, the composition and properties of biomass fuels are significantly different than those of coal and petroleum coke. For example, biomass is not a friable material and cannot be pulverized like coal or petroleum coke so would burn at a different rate in the kiln. The lower heat content of biomass also results in it not being a suitable fuel for a calcination process designed for high-heat content fuels.

In addition, as the objective is to manufacture lime, this necessitates use of commercial fuels for which a reliable supply will be available during the life of the plant. Even if biomass fuels could be used in the kilns, biomass fuels cannot yet generally be considered a commercial fuel. Farming to produce low quality biomass fuels, of the type that would potentially be available for use at the proposed plant, is in its infancy. The future availability of such fuel and its cost cannot be determined or predicted in a way that would allow it to be considered an available fuel. In this regard, key factors are the nature of government programs that accelerate the development of commercial biomass fuels and the extent to which rules are adopted and programs implemented that increase competition for this fuel, such as federal rules supporting use of renewable fuels. This situation with the proposed plant is different from projects in which the sources propose to utilize or develop certain biomass resources. In those cases, the sources are voluntarily accepting the uncertainty in the future availability and cost of material from the selected resource. Likewise, the circumstances are different from those of sources that propose to utilize waste as fuel and voluntarily accept the uncertainty associated with use of such material and the additional accompanying regulatory burdens.

These considerations, which preclude use of biomass as the required fuel for the proposed plant, also preclude use of a blend of biomass and coal and coke as the fuel for the plant. In addition, use of a blended fuel, even if feasible and otherwise appropriate, would act to negatively affect the operation of the plant. The increase in the complexity of operation, which would be inherent in using a blend of coal, coke and biomass, would be contrary to consistent and reliable operation, such that an increase in process upsets and production of off-specification lime should be contemplated. Similarly, the use of fuels derived from biomass by the proposed lime kiln is also rejected. The conversion of biomass into a biomass-derived fuel adds significantly to the costs of such a fuel compared to conventional fuels. Thus biomass derived fuels are readily rejected for purposes of BACT as their emission characteristic would be no better than those of natural gas but they would be several times more expensive, with higher cost impacts than those of natural gas.

Nitrogen oxides (NO<sub>x</sub>) - The Illinois EPA has determined that BACT for NO<sub>x</sub> emissions for the kilns to be combustion management, which would reduce the peak flame zone temperature. Add-on NO<sub>x</sub> control technology is not feasible for lime kilns given the operating temperatures at the locations at which reagent could be injected. In particular, the temperature of the exhaust after the fabric filter would be significantly lower than the bottom of the range of operating temperature of selective catalyst reduction (SCR) technology. SCR technology is not feasible before the fabric filter because the dust loading in the flue gas before filtration would interfere with efficient operation of the beds of catalyst in the SCR system.<sup>6</sup> The flue gas temperatures at the exit of kilns would also be significantly lower than the bottom of the range of operating temperature of nonselective catalyst reduction (NSCR) technology. As related to emissions of NO<sub>x</sub>, for a lime kiln, solid fuel is a "clean fuel." Because solid fuel is introduced into the kilns in a powdered form, it burns more slowly than natural gas producing less NO<sub>x</sub> than firing of natural gas.<sup>7</sup> An appropriate BACT limit for NO<sub>x</sub> is proposed at 3.5 lb NO<sub>x</sub>/ton of lime produced, 24-hour average.

Sulfur dioxide (SO<sub>2</sub>) - BACT for SO<sub>2</sub> emissions from the kilns is determined to be "natural scrubbing," as achieved with the limestone and lime dust produced by the lime kilns and captured by the fabric filters. The proposed plant would produce high-calcium lime from high-

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5. Given the nature of the kilns and use of fabric filters, it is unclear that the use of biomass fuel would be accompanied by significantly lower levels of emissions of regulated pollutants. For particulate, the performance of the filters reflects residual levels of dust in the flue gas, based on the capabilities of the filters, rather than removal of a percentage of dust in the flue gas. As such, performance is independent of the level of dust in the flue gas. Accordingly, "cleaner fuels," which contain less ash, do not translate into lower emissions of filterable particulate.

As addressed in more detail elsewhere, as the SO<sub>2</sub> emissions of the kilns would be controlled by "natural scrubbing," the reduction in SO<sub>2</sub> emissions with a lower sulfur fuel would only be a fraction of the reduction in the sulfur content of the fuel.

6. 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.

7. Given the physical geometry of a lime kiln, with combustion occurring at one end of a refractory line tube, "low-NO<sub>x</sub> burners," as used on boilers are not feasible for lime kilns. This is because management of secondary combustion air, as is a key aspect of low-NO<sub>x</sub> burners, cannot be accomplished with separate ports and adjustments for secondary combustion air. Rather, combustion in a lime kiln is accomplished with use of burners that appropriately manage primary air for good combustion and generally control or manage the amount of secondary air that enters the kiln to minimize excess air and formation of NO<sub>x</sub> and maintain the fuel and energy efficiency of the kiln.

These circumstances are different for those of a boiler. In a boiler, the mixing of fuel and combustion air can be manipulated and staged with low-NO<sub>x</sub> burners to minimize the conditions favorable to formation of NO<sub>x</sub>. This is particularly true for natural gas because it is burned as a gas, with combustion initially constrained by the availability of combustion air. This is different from combustion of solid fuel, which while constrained by availability of combustion air, must also address the time that it takes the individual particles of fuel to completely gasify and burn in the boiler.

calcium limestone. High-calcium limestone and lime are very reactive with an affinity for SO<sub>2</sub>. Indeed, Mississippi Lime plans to market the lime product from the proposed plant to coal-fired power plants equipped with scrubbers for control of SO<sub>2</sub> emissions at those plants. This reaction is facilitated as SO<sub>2</sub> is removed from the flue gas by dust not only in the preheater and ductwork but also as flue gas must pass through the dust cake accumulated on and in the filtration material in the fabric filters. An appropriate SO<sub>2</sub> BACT emission limit with the scrubber is 0.645 lbs SO<sub>2</sub> 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 SO<sub>2</sub> emissions attributable to sulfur introduced with fuel and disregarding any sulfur retained in the lime product.<sup>8</sup> Given the level of SO<sub>2</sub> removal that would be required to be achieved by natural scrubbing, further add-on control equipment is not warranted for SO<sub>2</sub>, both because of cost and because of the uncertainty of any significant further reduction in SO<sub>2</sub> emissions with such equipment. In addition, use of natural gas, which would be an essentially sulfur-free clean fuel for SO<sub>2</sub> emissions, is not warranted.<sup>9</sup> The associated cost for control of SO<sub>2</sub> emissions would clearly be excessive, as it would be in excess of \$20,000 per ton of SO<sub>2</sub> controlled.<sup>10</sup> The proposed plant

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8. Based on achievement of an actual fuel usage rate by the kilns of 10 tons per hour and a design sulfur content of 3.5 percent, fuel would introduce 700 pounds per hour of sulfur into a kiln, equivalent to 1400 pounds of SO<sub>2</sub> (10 x 0.035 x 2000 = 700, 700 x 2 = 1400). The controlled SO<sub>2</sub> emissions of the kiln based on a BACT limit of 0.645 pounds per ton of lime would be 32.25 pounds per hour (50 x 0.645 = 32.25). The nominal control efficiency for SO<sub>2</sub> achieved by natural scrubbing would be about 97.5 percent (1 - 32.25/1400)/100 = .977, ≈ 97 percent).

9. While certain lime kilns that produce food grade lime are fired with natural gas, this does not show that the use of natural gas is appropriate for a lime manufacturing plant like the proposed plant, which is being developed to produce various types of general purpose lime.

10. Based on a target firing rate for each kiln of 220 mmBtu/hour and a cost differential of \$3 per mmBtu between solid fuel and natural gas, use of natural gas would cost \$15,420,000 more dollars per year than natural gas (220 mmBtu/hour x 2 kilns x 8760 hours/year x \$3/mmBtu = \$11,560,000). Assuming that use of natural gas would reduce emissions of SO<sub>2</sub> to essentially zero, the accompanying reduction in SO<sub>2</sub> emissions would be 283 tons per year. This results in a cost-effectiveness from the use of natural gas that would be about \$40,000 per ton of SO<sub>2</sub> controlled (\$11,560,000/year ÷ 283 tons/year = \$40,847/ton). The cost-effectiveness of use of diesel fuel as the principal fuel for the kilns would be over \$200,000 per ton of SO<sub>2</sub> controlled, as the cost of diesel fuel per mmBtu is more than five times more than that of natural gas. The cost-effectiveness of the use of lower sulfur and more costly solid fuels is also excessive. The key factor in all these evaluations of the potential use of alternative fuels is that most of the SO<sub>2</sub> emissions theoretically present with solid fuel would be controlled by natural scrubbing and as they are already being controlled without any added cost, would not be affected by the use of an alternative fuel.

Consideration of the reduction in emissions of other regulated pollutants that might accompany use of natural gas would not meaningfully alter this conclusion. This is because it should not be expected that the particulate emissions of the kilns would change if fired on natural gas, given the level of control of required for particulate with most particulate attributable to limestone and lime dust. The only accompanying decrease in particulate emissions would be from elimination of fuel handling, involving emissions of at most a few tons per year.

This conclusion would not be altered if GHGs were a regulated NSR pollutant. This is because the upper bound on reasonable cost-effectiveness values for the control of GHGs is in the range of \$10 to \$20 per ton of GHG controlled, compared to \$5,000 to

would also almost certainly no longer be a viable project from a business perspective as it would not be able to compete in the marketplace with other existing lime manufacturing plants in the Midwest that produce general purpose lime as these existing plants use solid fuel rather than natural gas.<sup>11</sup>

Particulate matter - The BACT for particulate emissions from the kilns is determined to be fabric filtration or baghouses. Fabric filtration is generally considered the most effective control technology for direct particulate emissions in applications where filtration is feasible and practical, as is the case with lime kilns.<sup>12</sup> A limit of 0.14 lb/ton of lime produced is proposed for filterable particulate matter. This limit would be significantly more stringent than the standard for lime kilns set by the NESHAP for lime manufacturing plants, which is equivalent to about 0.20 lb/ton of lime produced.<sup>13</sup> Separate BACT limits are also proposed to be set for particulate as PM<sub>10</sub> and PM<sub>2.5</sub> (total filterable and condensable) at 0.18 and 0.105 lb/ton of lime produced, 3-hour average. These limits would directly address emissions of particulate measured as PM<sub>10</sub> and PM<sub>2.5</sub>.

Carbon monoxide (CO) - BACT for CO emissions from the kilns is determined to be good combustion practice. While CO emissions could potentially be reduced by operation with additional excess air, this would be counter-productive. Use of additional excess air would directly act to increase NO<sub>x</sub> emissions. It would also act to increase particulate emissions of the kilns as the volume of flue gas that would be handled by the filters would increase. It would also reduce thermal efficiency of the kilns, acting to increase emissions of GHGs. An appropriate BACT limit for CO is proposed at 2.50 lb per ton of lime produced, 24-hour average.

#### Limestone and Solid Fuel Handling

BACT for particulate emission for affected units involved in handling and processing of limestone and solid fuel is proposed to be opacity of fugitive emissions of no more than 10 percent, stack emissions of PM of 0.005 gr/dscf with no more than 7 percent opacity, and no visible emissions from the enclosed units. These limits would provide effective control of particulate emissions. These BACT requirements

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\$10,000 per ton. For example, if one assumes that the use of natural gas would eliminate emissions of 300,000 tons of GHG annually, with a reasonable cost-effectiveness of \$15 per ton, the value of this reduction would be \$4,500,000 per year. The adjusted cost-effectiveness for the use of the alternative use of natural gas would then become \$25,000 per ton of SO<sub>2</sub> controlled ( $(\$11,560,000 - \$4,500,000) \div 283 \text{ tons} = \$24,947/\text{ton}, \approx \$25,000/\text{ton}$ ).

11. As the proposed plant would have lower emissions and better fuel efficiency than these existing plants, it is preferable from an environmental perspective that the demand for general purpose lime be supplied by the proposed plant.

12. The contribution of the NO<sub>x</sub> and SO<sub>2</sub> emissions of the kilns to emissions of condensable particulate and to secondary particulate matter in the ambient air, which is formed in the atmosphere as NO<sub>x</sub> and SO<sub>2</sub> react to form particulate, would be directly addressed by the BACT limits set for emissions of NO<sub>x</sub> and SO<sub>2</sub>.

13. The NESHAP limit of 0.10 lb/ton of limestone feed to the kiln is equivalent to about 0.20 lb/ton of lime product, as the limestone input to a kiln is about twice its lime output.

are accompanied by requirements for inspections, recordkeeping, notifications and reporting.

#### Lime and Kiln Dust Handling Operations

BACT for particulate emissions from product conveying, processing and loadout is enclosure and filtration. BACT for fugitive particulate emissions from product loadout is partial enclosure and loadout practices to minimize loss of material. The proposed BACT determination would appropriately establish BACT for the different types of operations, with readily enforced performance standards as it is practical to do so, e.g., no visible emissions and use of appropriately designed filtration devices. These BACT requirements are accompanied by requirements for performance testing, operational instrumentation, inspections, recordkeeping, notifications and reporting.

#### Storage Piles and Roadways

BACT for particulate emissions from the coal and petroleum coke storage piles and the limestone storage pile is determined to be opacity of fugitive emissions to be less than 10 percent. BACT for fugitive dust or particulate matter emissions generated by vehicle traffic and wind erosion on roadways, parking areas and other access area at the plant to be an opacity less than 10 percent from these units, accompanied by a fugitive dust control program.

The proposed BACT determination for storage piles and roadways is intended to require that these emissions be effectively controlled while still providing appropriate operational flexibility in the manner with which this is accomplished in practice by the source. This general approach has been taken because of the Illinois EPA's experience with fugitive dust control programs. This experience indicates that dust control programs must be flexible to appropriately respond to changing operation and weather conditions (rain, hot, dry weather in the summer, and snow and ice in the winter). In addition, dust control programs change and evolve over time as new control techniques become available to control emissions. Accordingly, like material handling operations, roadways associated with the proposed plant are most appropriately addressed through establishment of broad BACT control requirements, rather than with detailed, prescriptive requirements for control of emissions.

### VIII. AIR QUALITY ANALYSIS

Mississippi Lime has submitted an air quality analyses that assess the potential effect of the proposed plant on ambient air quality. The analyses were conducted by Shell Engineering & Associates, Inc. (Shell Engineering) and addressed emissions of particulate, NO<sub>x</sub>, CO, and SO<sub>2</sub>, i.e., the PSD pollutants that would be emitted in significant amounts by the proposed plant. The analyses used reference dispersion models and other approved methodology. The results of these analyses follow.

The first step in these analyses is to determine the maximum impacts of the proposed lime plant by itself (See Table 1). This evaluation shows

that the plant would not have significant impacts on air quality for certain pollutants and averaging times. In particular, this analysis shows maximum impacts for carbon monoxide (CO) that are not considered significant and no further analysis is required for CO.<sup>14</sup> Because the predicted maximum impacts for certain other pollutants and averaging times are considered significant under the PSD rules, rather than de minimis or insignificant, further analyses were performed that also addressed the emissions of other sources besides the proposed plant.

Table 1: Lime Plant Maximum Impacts (micrograms/cubic meter or ug/m<sup>3</sup>)

Pollutant	Averaging Period	Maximum Predicted Impact	PSD Significant Impact Level
NO <sub>2</sub>	1-hour	55.5	7.5
	Annual	2.25	1
PM <sub>10</sub>	24-hour	7.96	5
	Annual	30.52	1
PM <sub>2.5</sub>	24-hour	4.54	1.2
	Annual	1.14	0.3
SO <sub>2</sub>	1-hour	11.40	7.9
	3-hour	10.36	25
	24-hour	4.54	5
	Annual	0.55	1
CO	1-hour	66.47	2,000
	8-hour	29.66	500

The further analyses that were performed compared predicted ambient impacts to the applicable PSD increments<sup>15</sup> and to the National Ambient Air Quality Standards (NAAQS). The analysis for consumption of PSD increment addressed the impact of the emissions NO<sub>x</sub> and PM<sub>10</sub> from the proposed plant and other new and modified emission units since the baseline was set in Randolph County. The results of these analyses are shown in Table 2 and show compliance with the applicable PSD Increments.<sup>16</sup>

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14. This analysis also shows that the proposed plant would not have significant impacts for sulfur dioxide (SO<sub>2</sub>) on a 3-hour, 24-hour, and annual basis.

15. The PSD rules set limits on the maximum increases in concentration of SO<sub>2</sub> (3-hour, 24-hour, and annual average), PM<sub>10</sub> (24-hour and annual average) and NO<sub>2</sub> (annual average) in the ambient air that may occur in an area as a result of the construction of new and modified emission units. These limits are called "PSD increments". The proposed lime manufacturing plant would be in an area that is designated a Class II area, for which the applicable PSD increments accommodate moderate growth in emissions. The consumption of increment is evaluated from a "baseline date" set as the date that a complete PSD application is first submitted for an area for a pollutant, so as to reflect the existing air quality for the pollutant in the area prior to proposal of a major project that is subject to the PSD rules. The increase in ambient concentration of pollutants due to a major project is also limited by the National Ambient Air Quality Standards (NAAQS). In no case can a PSD permit be issued that would cause or significantly contribute to a violation of the NAAQS.

16. This analysis did not address SO<sub>2</sub> because the proposed plant was shown to not have significant impacts on SO<sub>2</sub> air quality for the averaging time for which SO<sub>2</sub> increments have been established by USEPA.

Table 2: Results of Analysis of PSD Increment Consumption (ug/m<sup>3</sup>)

Pollutant	Averaging Period	Maximum Impact Concentration	PSD Increment
NO <sub>2</sub>	Annual	12	25
PM <sub>10</sub>	24-Hour	29	30
	Annual	8	17

The further air quality analyses to evaluate the impacts of the proposed lime plant on compliance with the NAAQS accounted for the emissions of both the proposed plant and existing sources. The contribution of existing sources is addressed by modeling of units at larger sources and by use of a monitored background concentration to account for units that are not individually modeled. The monitored concentrations were taken from ambient monitoring stations operated by the Illinois EPA that conservatively represent the existing air quality at the plant site, as these monitors are located in areas that are more developed, i.e., have more emission source. The maximum air quality impacts predicted by these analyses are shown in Table 3.

Table 3: Results of Analysis of Maximum Ambient Concentrations (ug/m<sup>3</sup>)

Pollutant	Averaging Period	Maximum Modeled Impact	Background Concentration	Projected Overall Concentration	NAAQS
NO <sub>2</sub>	1-hour	65.10	117.00	182.10	188
	Annual	12.96	30.19	43.15	100
PM <sub>10</sub>	24-Hour	31.45	65.00	96.45	150
	Annual	9.34	24.00	33.34	50
PM <sub>2.5</sub>	24-hour	6.12	26.70	32.22	35
	Annual	1.49	12.10	13.59	15
SO <sub>2</sub>	1-hour	11.40	174.00	185.40	198

IX. IMPACTS ON SOIL, VEGETATION AND VISIBILITY

At the level of impacts predicted by the air quality analysis, the emissions of the proposed lime manufacturing plant should have no significant impact on soils, vegetation, and visibility in the surrounding areas. Mississippi Lime submitted further analyses in its application specifically addressing impacts on soils, vegetation, and visibility. They confirm that the impacts of the proposed plant will not be significant.

X. PERMIT CONDITIONS

The conditions of the permit would set forth the air pollution control requirements that the project must meet. These requirements include the applicable emission standards that apply to the project. They also include the measures that must be used and the emission limits that must be met as BACT for emissions of PM, CO, SO<sub>2</sub>, and NO<sub>x</sub> from the plant.

The permit would also establish enforceable limitations on the amount of emissions for which the project is permitted. Limitations are set both for PM, CO, SO<sub>2</sub>, and NO<sub>x</sub>, for which the project is major, and for pollutants for which the project is not major. In addition to annual limitations on emissions, the permit includes short-term limitations and operational limitation, as needed to provide practical enforceability of the annual emission limitations. As previously noted, actual emissions associated with the project would be less than the permitted emissions to the extent that the facility operates at less than capacity and control equipment normally operates to achieve emission rates that are lower than the applicable standards and limitation.

The permit would also establish appropriate compliance procedures for the ongoing operation of the plant, including requirements for emissions testing, required work practices, operational monitoring, recordkeeping, and reporting. These measures are imposed to assure that the operation and emissions of the facility are appropriately tracked to confirm compliance with the various limitations and requirements established for individual emission units.

XI. REQUEST FOR COMMENT

It is the Illinois EPA's preliminary determination that the application for a construction permit meets all applicable state and federal air pollution control requirements. The Illinois EPA is requesting public comments before taking action to issue a permit.

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