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August 3, 2005

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BUREAU OF AIR REGULATION

A.A. Linero, P.E.
Program Administrator
New Source Review Section
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: Florida Mining Corporation – Mabel Cement Plant
Response to Request for Additional Information dated June 24, 2005
DEP File No. 1190040-001-AC (PSD-FL-356)

Dear Mr. Linero:

Please find attached a response to your request for additional information dated June 24, 2005. All of your information request items are reproduced, preserving your numbering. Responses follow each item. Numerous attachments provide further information.

I trust that this information is responsive to your request. Please contact me if further information is required to process the application.

Sincerely,

SEAL

Steven C. Cullen, P.E.
Koogler & Associates

Consultant to Florida Mining Corporation

Copies to: Jim Bassett
Paul Mazak, II

1. There does not appear to be any preliminary and original engineering of the kind typically associated with a cement project that has progressed to the stage where an air permit application is submitted. Typically at this point in cement project development, there is preliminary work by an engineering and design firm if not by the actual potential suppliers such as Polysius, F.L. Smidth, KHD Humboldt Wedag, CLE, etc. Please provide design information and engineering drawings.

Response: The applicant contends that specifying a cement plant manufacturer at this time will reduce their ability to negotiate plant and engineering costs and terms. It is anticipated that design information and engineering drawings will be produced by the cement plant manufacturer.

The applicant further contends that the cement plant will be manufactured for this project by a company that has manufactured and supplied cement plants in the U.S. Currently operating plants in the U.S. are able to meet fixed emission standards, such as NSPS and NESHAP, as well as specific standards, such as BACT. Reasonable assurance for the Department arises from the fact that there a limited number of companies that produce cement plants, as indicated in your question.

In terms of air pollution control equipment, the Department has issued air construction permits for cement plants before design information and engineering drawings have been available.

The applicant is having ongoing discussions with cement plant manufacturers

2. The proposed project is virtually identical in layout, production capacity, and emission characteristics to another proposed project in Florida. Please confirm that the same emissions and assumed design make sense for the area and raw materials available where the project is planned.

Response: The proposed layout is similar to other cement plants because the process flow in each is similar. The proposed plant does not have rail access, so the plant location as initially proposed is close to the main east-west roadway, State Road 50. For this same reason, the cement silos and coal storage are in proximity to the entrance road.

The raw material and raw milling unit operations are in proximity to the current and expected mining areas. The other unit operations are logically placed between raw material input and product output operations.

The proposed production capacity is similar to three proposed cement plant projects: second kilns at existing cement plants in Alachua County, Hernando County, and Suwannee County; as well as being consistent with the permitted production capacity for the Rinker cement plant in Dade County.

The basis for production capacity includes resources in reserves and market size. The proposed project has suitable reserves to propose an approximately 1 million ton per year clinker production rate. The projected cement needs for Central Florida, in proximity to this proposed project, are great enough to accommodate this production rate.

The proposed emissions are consistent with the Department's recent BACT determinations for Florida Rock Industries (PSD-FL-350) in Alachua County and for Rinker/Florida Crushed Stone (PSD-FL-351) in Hernando County.

The area and raw materials share enough similarities with these other projects for the layout, production capacity, and emissions characteristics to make sense.

3. The requested PM limits are 0.23 lb/ton of clinker and 0.1 lb/ton of clinker from the kiln and clinker cooler respectively. This equates to 0.33 lb/ton of clinker or roughly 0.2 lb/ton of feed. For reference, F.L. Smidth guaranteed combined kiln and cooler emissions of 0.125 lb/ton of feed through a single baghouse for the new Titan America kiln in Medley, Florida. Titan has requested lowering the limit to 0.09 lb/ton of feed. This equates to roughly 0.15 lb/ton of clinker for kiln and cooler PM emissions combined. This is less than half of the value proposed by Florida Mining Corporation. Please provide any comments regarding this issue.

Response: As described above, the proposed PM limits are based directly on very recent Department BACT determinations, with separate control devices for the kiln and clinker cooler. These are merely proposed emissions limitations. The Department will make determinations of BACT for each PSD pollutant during the permitting process.

4. It is possible to design the plant with a single stack and avoid some particulate emissions. Is such a configuration an option for this project? If not, please explain.

Response: A single stack configuration, for the kiln and clinker cooler, remains an option for this project. The choice of stack configurations will be resolved after selection of a cement plant manufacturer. If necessary, dispersion modeling will be updated to reflect any changes.

5. Will any raw materials, fuels, or products be shipped in or out by railroad? What efforts will be made to minimize truck traffic, dust emissions from vehicular traffic, and emissions from vehicular fuel combustion associated with the proposed project? Please provide a detailed discussion regarding truck traffic that will be generated from the construction and operation of the new facility.

Response: No raw materials, fuels, or products will be shipped in or out by railroad. Truck traffic will be minimized by plant location in proximity to State Road 50. Dust emissions will be minimized by paving and maintenance of travel surfaces. The use of a vacuum/sweeper truck is anticipated for the entrance road.

No specific efforts will be made to minimize emissions from vehicular fuel combustion associated with the proposed project. Fuel-based emissions from vehicle engines are regulated by the federal government at the engine manufacturer. Also, most of the truck traffic will be vehicles operated by transportation vendors, not by trucks operated by the facility.

Truck traffic generated from the construction of the new facility will vary based on the construction phase. Such truck traffic will include the delivery of ready mixed concrete for foundations.

Truck traffic generated from the operation of the facility was discussed in detail in a section of the application form. This included emissions estimations. The discussion included trucks hauling solid fuel and raw materials (additives) in, and trucks hauling finished cement out.

It is anticipated that raw materials (limestone and overburden) from onsite will be delivered to the quarry hall by conveyor. The application also addressed this operating scenario.

6. Describe the primary fuel firing scenarios and describe the ratio of heat input at various fuel mixtures. Detail why heat input ratios might change under normal operating conditions and emissions. Provide an estimate of pollutant emissions under each scenario.

Response:
The primary fuel firing scenarios include the fuel fired through the kiln burner to be pulverized coal or a mixture of coal and petroleum coke. The fuel fired through the calciner burner will typically be pulverized coal, pulverized petroleum coke, or a mixture of the two.

In general the ratio of the heat input between the kiln and calciner is about 40% of the heat value fired at the kiln burner and about 60% of the heat value fired at the calciner burner. The heat input ratio between burners is somewhat independent of fuel mixtures and operating conditions.

The heat input ratio of various fuel mixtures can vary. Typically, the kiln burner will burn coal at 100%, but may burn a mixture of about 30% coke and 70% coal. Typically, the calciner burner will burn coal at 100%, but may burn a mixture of about 30% coke and 70% coal, or other fuels in various combinations with or without coal. Other fuels described in the application include natural gas, propane, fuel oil, tire-derived fuel at up to 15% of the total heat value, high carbon fly ash as high as 60% of the total heat value, and used oil.

The heat input to the system is determined by the raw material feed rate to the kiln and the burnability of the raw materials. Increase in feed rate or burnability will require increases in total heat input rate. The feed rate is limited by the plant mechanical design and raw material properties. The raw material burnability is most dependent on the chemistry of the onsite raw materials and the raw meal fineness from the raw mill.

Fuel ratios will be affected by changes in fuel parameters, including heat value and volatility; fuel availability and delivered price.

Changes in heat input ratios or in fuels are not expected to have significant effects on emissions from the kiln system. Emissions variations over long averaging times are expected to be minimal in terms of concentration or mass per unit time. Most pollutant emissions are assumed as independent of fuels and heat input ratios. At all times emissions are expected to be within the limits proposed in the application.

Particulate matter emissions are assumed to be independent of fuels and heat input ratios and are limited by control equipment. CO and VOC emissions are controlled mainly by raw material selection and combustion practices, such as adequate turbulence and residence time following the combustion chamber.

SO2 emissions are controlled by inherent scrubbing by the alkalis in the raw materials prior to the fuel firing locations and not by limiting sulfur from fuels. When sufficient alkali is present in the raw materials, sulfur from fuels exits the kiln system with clinker. Sulfur dioxide emissions observed from cement plants can result from sulfur in the fuel that is in excess of alkalis in the feed or from sulfur (e.g., pyritic sulfur) in raw materials fed to the preheater. Raw materials in Florida are typically low in pyritic sulfur.

NOx emissions are affected by the fuels fired and the heat input ratios. More volatile fuels are often burned in the calciner to allow for more reduction of the NOx generated by the main burner of the kiln. The combustion of tires functions in the same way to reduce NOx emissions. The heat input ratio between the kiln burner and the calciner burner can affect NOx emissions, as fuel burned in the kiln burner generates thermal NOx due to the high temperatures encountered in this area. Fuels burned in the calciner burner at lower temperatures generate less NOx per unit of heat input, and are also staged to create reducing zones.

During startup, fuel consumption will be greater than during steady state operations because heat is not recovered for combustion air. Emissions may likewise be affected as the kiln system is heated and raw materials are introduced through the preheater. Data from operating cement plants have demonstrated that mass emission limitations are not typically exceeded during startup.

7. Typical fuel specifications were provided for the proposed fuels with the exception of used oil. Provide a description and expected analysis of the used oil to be combusted.

Response: Typical used oil specifications are included as an attachment to this response.

8. Recent testing conducted at other cement plants in Florida indicated that lower NOX emissions are possible by selective non-catalytic reduction (SNCR) than proposed. According to the application, the cost-effectiveness to achieve 1.95 lb NOX/ton was estimated at a little more than $1,000 per ton of NOX removed. An application was recently received by the State of Arizona proposing a limit of 1.15 lb/ton based on modeling results. An existing Heidelberger (SCANCEM) facility in Sweden achieves 0.9 lb NOX/ton by SNCR. Please develop and submit a cost-effectiveness analysis to achieve 1.5 and 1.0 lb NOX/ton of clinker.

Response: Cost effectiveness analyses to achieve 1.5 and 1.0 lb/ton clinker NOx emission limits using SNCR are included as an attachment to this response in Tables 1 and 2, respectively. As shown in Tables 1 and 2, the cost effectiveness for SNCR is $982/ton of NOx removed and $898/ton of NOx removed to achieve emission limits of 1.5 lb/ton clinker and 1.0 lb/ton clinker, respectively.

Of greater concern is the increased quantity of ammonia reagent necessary for higher levels of control, and corresponding effects on handling, storage, and ammonia slip.

9. With reference to Pages 77 and 78, Has Florida Mining Corporation inquired of catalyst manufacturers whether or not catalyst poisoning is a given if a selective catalytic reduction (SCR) system is located prior to the baghouse? Note that the dust loading in the area (parallel to downcomer from the preheater) where an SCR system is located is much lower than in the preheater and much lower than after the raw mill. There is much experience now at coal fired power plants operating SCR systems prior to electrostatic precipitators.

Response: Flemming Hansen, the manager of SCR Catalyst & Technology for Haldor Topsoe, a leading catalyst manufacturer for both the US and Europe, provided information in email correspondence dated June 30, 2005. Mr. Hansen stated:

> "SCR for cement kilns have been studied by us and other catalyst suppliers but as SCR is not considered BACT, we don't see much "real" interest in pursuing this for plants in neither Europe nor US and have cutback further studies. To my knowledge there is only a single full scale installation, Solnhofen in Germany (dry kiln) which operates fairly well. Due to the high level of particulates, SCR for cement kiln can be problematic and cause clogging of the catalyst channels. The high alkali content in the cement dust can also cause poisoning of the catalyst. Based on our studies and testing we find that with the correct choice of catalyst pitch and frequent cleaning of the catalyst with steam or air blowers the operation of an SCR upstream of the particulate removal should be possible. Down stream of the particulate filters SCR operation should be relatively trouble free. "

Although Mr. Hansen stated that they believes it could be possible to operate an SCR system upstream of the PM control device with the "correct choice of catalyst pitch and frequent cleaning of the catalyst with steam or air blowers", this is only theoretical and has not been proven at a cement kiln operation. Therefore, SCR is not considered further as a feasible NOx control technique for the cement kiln.

10. With respect to Section 6.4.3, please explain how SCR would operate in a cement plant in tandem with overfire air (OFA) and Low NOX burners (LNB) described by Florida Mining Corporation as the "Top" control technique.

Response: In this control technique, OFA and LNB are utilized as part of the combustion system, while SCR would be utilized downstream of the combustion equipment. SCR along with OFA and LNB that is described in the application and listed as the "top" control technique in Table 7-9 is not specifically representing a cement plant operation. In a cement plant, OFA and LNB would be utilized at the kiln (where coal or other fuel is combusted) and the SCR system would operate outside of the kiln, downstream after the gas has cooled somewhat.

11. With reference to Page 75, reburn is actually incorporated into various staged combustion calciner designs. The procedure involves burning some or all of the calciner fuel in an aggressive reducing atmosphere. Arguably the F.L. Smidth Low NOX calciner, the Polysius Multistaged Combustion (MSC) calciner at Florida Rock, and the KHD Humboldt Wedag Pyroclon all incorporate reburn to some degree. Does the reburn design described operate within the kiln, the calciner, or after the calciner?

Response: The plant design is currently in the preliminary stages and design details such as the description of incorporation of "reburn to some degree" is not yet known. Since this is a new plant design, the incorporation of reburn will be considered by the vendor in the final plant design. The location of reburn in the kiln, calciner, or after the calciner will also be determined in the final plant design.

12. NOX control described in the application appears to rely on destroying thermal NOX after it is formed in the kiln, prevention of fuel NOX formation in the calciner, and/or destruction by reagent injection after the calciner. What consideration has been given to minimizing thermal NOX formation by flame cooling, Low NOX kiln burners, or "intelligent" automated expert control systems like Linkman or Polexpert?

Response: The prevention of NOx emissions by low NOx burners or similar plant designs are valid design considerations. However, the plant design is currently in the preliminary stages and designs to incorporate low NOx burners or other pollution prevention techniques will be considered by the vendor and Florida Mining Corporation in the final plant design.

13. The BACT proposal for CO is 3.6 lb/ton of clinker. For reference, F.L. Smidth guaranteed a value of 1.77 lb CO/ton for the Titan project in Medley. Titan has requested a lower value of approximately 1.33 lb CO/ton while achieving 2.1 lb NOX/ton of clinker. The Department's observation is that some designs provide insufficient residence time following introduction of tertiary burnout air to adequately

reduce CO. Please evaluate (under your "Good Combustion Practices" proposal) the possibility of increasing the length of the ductwork from the top of the calciner to the bottom cyclone. The cost per ton of CO removed can be estimated from the construction and operational considerations associated with the residence time to complete burnout.

Response: An evaluation of ductwork length with respect to residence time for CO burnout will be recommended to the plant manufacturer, after selection. In this case, the Department's request can be used to assist in the plant-specific design.

14. VOC control to achieve 0.12 lb/ton of clinker is given as "Good Combustion Practices". Regardless of combustion practices, VOC emissions can be high unless raw materials (especially additives) are selected that will not evolve VOC in the preheater. Please describe the raw material procurement practices for mill scale, fly ash, etc. that can influence both VOC and CO emissions. The proposed value appears to be adequate.

Response: Detailed raw material procurement practices will be developed prior to plant operation. Such practices will ensure that raw materials (especially additives) are selected that will not evolve VOC in the preheater.

15. SO2 control to achieve 0.28 lb/ton of clinker is given as "dry scrubbing (hydrated lime injection)" as necessary when the raw mill is not operating and inherent "limestone scrubbing" when the raw mill is operating. Please address the nature of the raw materials and include this in the Top Down analysis.

Response: Sulfur in the raw material from the property is assumed to be low, based on data from the USGS, included as an attachment to this report. The data show consistently low sulfur content in soils and surficial materials across central Florida, with concentrations of less than 0.08 percent.

16. The SO2 limit for Florida Rock Kiln 1 is 0.16 lb/ton of clinker on a 24-hour basis. They do not practice hydrated lime injection. Please provide a rationale for the greater emission limit request given that hydrated lime injection is available if needed. Please provide data on sulfur in the raw material from the property.

Response: Per the recent permit No. 0010087-013-AC, the SO2 limit for the proposed Florida Rock Kiln 2 is 0.28 lb/ton of clinker on a 24-hour basis, and hydrated lime injection is to be used when higher sulfur feed or fuels are used. The requested emission limit for the Florida Mining Mabel Cement Plant is identical.

Regarding Florida Rock Kiln 1, the initial BACT emission limit for SO2 was also identical (i.e., 0.28 lb/ton clinker). The referenced emission limit of 0.16 lb/ton of clinker was volunteered by Florida Rock in 2002, with an accompanying production rate increase.

Sulfur in the raw material from the property is assumed to be low, based on data from the USGS, included as an attachment to this report. The data show consistently low sulfur content in soils and surficial materials across central Florida, with concentrations of less than 0.08 percent.

17. What additives will be used to insure the correct alkali to sulfur ratio is maintained when using petroleum coke? Florida limestone is low in alkali. Use of high sulfur petroleum coke can upset the balance between alkali and sulfur that is needed to insure fuel sulfur is incorporated into the clinker rather than deposited within the internal cycle (calciner/bottom cyclone/kiln inlet). Submit a projected chemical analysis of the additives likely to be used at this plant.

Response: The Department has addressed this question, in part, in a recent Best Available Control Technology Determination for Florida Crushed Stone, accompanying Permit no. 0530021-009-AC. In the determination, the Department states:

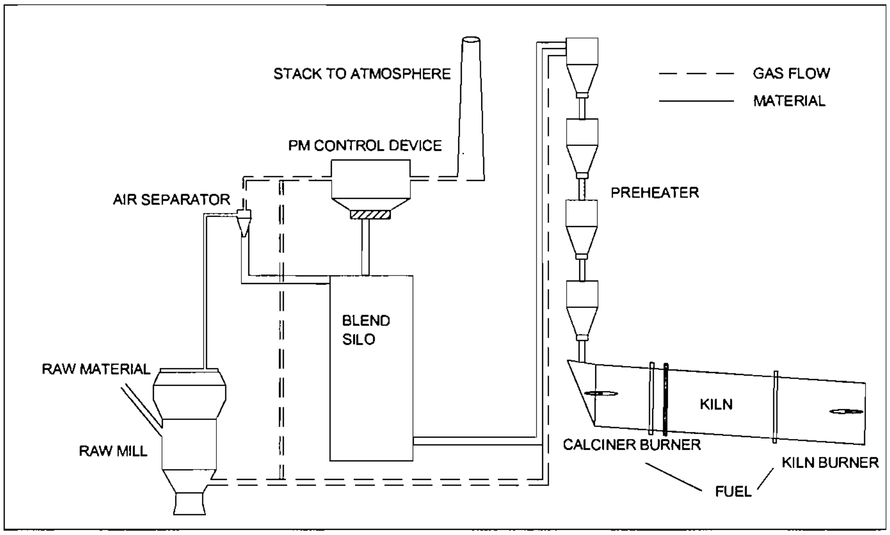
> *"The Department does not believe that burning of petroleum coke will cause additional SO2 emissions compared with coal because of the virtually complete scrubbing that occurs in the calciner."*

The alkali-sulfur balance necessary to avoid internal buildup is an operational issue. The most common alkalis are sodium and potassium, and USGS data included with this response show that both are consistently low in soils and surficial materials across Florida. This may limit the amount of petroleum coke that can be burned, or provide the opportunity to seek additives containing these elements.

Projected chemical analyses of the additives likely to be used at this plant will be submitted to the Department when available.

18. Please provide a diagram showing the introduction points of mercury into the process and its fate including the internal cycle (calciner/kiln) and the external cycle (raw mill/preheater/dust control equipment). What measures have been considered to minimize emissions of mercury entering the process or emitted from the kiln stack?

Response: The following simplified diagram shows the introduction points for mercury into the process, and can illustrate the internal cycle and the external cycle.



Mercury is introduced into the process with raw materials at the raw mill and with fuels at the burners. Mercury in fuels is volatilized during combustion and is adsorbed on raw meal in the raw mill (when operating), adsorbed onto particulate matter captured by the particulate matter control device; or emitted to the atmosphere via the stack. Mercury in raw materials is volatilized by kiln exhaust gases in the raw mill and is adsorbed onto particulate matter captured by the particulate matter control device, or emitted to the atmosphere via the stack.

The external cycle is mercury emitted from the stack, and can be from raw materials and fuels, with or without the raw mill running. The internal cycle is from mercury adsorbed onto raw meal or dust captured by the control device; both of which are typically conveyed to the blending silo. The raw meal from the blending silo is conveyed to the preheater and the adsorbed mercury with any remaining mercury is volatilized again, within the internal cycle.

No specific measures have been considered to minimize emissions of mercury entering the process. Due to its volatility, virtually all of the mercury input to the system is assumed to be emitted to the atmosphere via the kiln stack. No specific measures have been considered to minimize emissions of mercury emitted from the stack. The proposed emission limitation for mercury is less than the PSD regulatory threshold.

19. Please provide the protocol for the mercury material balance to be relied upon to insure emissions are no greater than 122 lb/year. Include proposed process testing locations, frequency of testing, and methods. Please review the availability and capability of continuous mercury monitoring equipment in lieu of, or in addition to the material balance.

Response: The Department has established a monitoring protocol for mercury emissions in several permits, including the recent permit issued to Florida Crushed Stone (Permit

No. 0530021-009-AC). The protocol is acceptable to the applicant and is reproduced below:

> *Material Balance Analysis of Mercury: The owner or operator shall demonstrate compliance with the mercury throughput limitation by material balance and making and maintaining records of monthly and rolling 12-month mercury throughput. The owner or operator shall, for each month of sampling required by this condition, perform daily sampling of the raw mill feed, coal, petroleum coke, and tires, and shall composite the daily samples each month, and shall analyze the monthly composite sample to determine mercury content of these materials for the month. The owner or operator shall determine the mass of mercury introduced into the pyroprocessing system (in units of pounds per month) from the total of the product of the mercury content from the monthly composite analysis and the mass of each material or fuel used during the month. The consecutive 12-month record shall be determined from the individual monthly records for the current month and the preceding eleven months and shall be expressed in units of pounds of mercury per consecutive 12-month period. Such records shall be completed no later than 25 days following the month of the records. To determine the mercury content of the feed material and fuels to be used in the monthly calculation, sampling and analysis shall be performed in accordance with the following schedule:*
>
> 1. *During the first quarter of plant operation, sample each month and analyze each month's composite sample.*
> 2. *After the first quarter, sample for one month of each quarter and analyze that month's composite sample.*

EPA is evaluating mercury CEM for the Utility MACT Working Group. In a March 2003 Mercury Monitoring Update, EPA identified certain concerns related to mercury CEM, including:

- Stability, reliability, and availability of calibration standards
- Loss of sample in handling system
- Species conversion
- CEMS costs, complexity, performance
- CEMS application on US sources
- Fuel, equipment, control uniqueness
- Availability

EPA is conducting further study. As mercury CEM are still being evaluated for utility sources, it is likely premature to consider for application to other source categories such as cement.

20. Has Florida Mining Corporation or affiliates had any violations (or warning letters) related to any Department regulations at any of their facilities? Have officers of Florida Mining Corporation also been officers of other companies that have had violations (or warning letters) of Department regulations at any facilities? Please provide all documentation in relation to any such violations.

Response: The Department issued a warning letter to Florida Mining Corporation, dated February 17, 2004, in which possible violations were presented. These possible violations were in reference to the construction of a culverted crossing of Jumper Creek to facilitate the removal of overburden and to support the existing agricultural operation. The crossing was constructed over surface waters, and according to the Department's assessment no wetlands were impacted due to the construction.

The applicant has since obtained an after-the-fact permit for the crossing, and continues to discuss with the Department the resolution of the potential violation.

No other violations or warning letters were identified.

21. Please list experience of company officers owning or operating industrial enterprises requiring air permits in the State of Florida or in other states.

Response: The Florida Department of State, Division of Corporations, Corporations Online Public Inquiry system, in the Officer/Director Detail section, lists only Paul Mazak, II as President of Florida Mining Corporation.

Mr. Mazak reports no prior experience owning or operating industrial enterprises requiring air permits in the State of Florida or in other states.

22. Please provide information as to the experience of the operators of the proposed site. If the position of plant operator is still to be determined, please describe the minimum requirements for this position established by your company including, but not limited to, total years experience in the cement industry, total years experience as plant operator, educational background, etc.

Response: The position of plant operator is still to be determined, and the applicant has not established minimum requirements for this position. Important factors will include total years experience in the cement industry, total years experience as plant operator, and educational background.

23. Please provide information as to the experience of the plant manager of the proposed site. If the position of plant manager is still to be determined, please describe the minimum requirements for this position established by your company including, but not limited to, total years experience in the cement industry, total years experience as plant manager, educational background, etc.

Response: The position of plant manager is still to be determined, and the applicant has not established minimum requirements for this position. Important factors will include total years experience in the cement industry, total years experience as plant manager, and educational background.

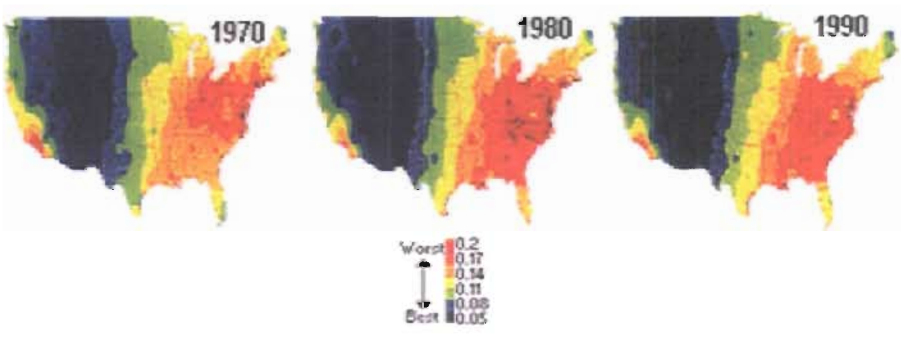
24. A very cursory assessment was provided pursuant to Paragraph 62-212.400(h)5., F.A.C. The rule requires information relating to the air quality impacts of, and the nature and extent of, all general commercial, residential, industrial and other growth which has occurred since August 7, 1977, in the area the facility or modification would affect. While the applicant believes the largest area is a 3 kilometer radius, the Department believes the radius arguably includes the entire county and possibly the contiguous counties. The impacts include visibility impairment and effects on regional ozone concentrations. Please expand the write-up to include development in Sumter and surrounding counties as well as ambient air quality trends in and near Sumter County.

Response: Although the report defined the area the plant would affect as equal to the area of significant impact, detailed information was provided on the nature and extent of, all general commercial, residential, industrial and other growth which has occurred since August 7, 1977, in Sumter County.

Expanding this assessment beyond the area the plant would affect for the entire county was necessary because the development parameters previously reported are available on a county-wide basis. Further expansion of the assessment of development to include surrounding counties is not warranted.

To be responsive to the Department, information was developed on visibility impairment and ambient air quality trends in and near Sumter County, including ozone concentrations; as a result of general commercial, residential, industrial and other growth which has occurred since August 7, 1977.

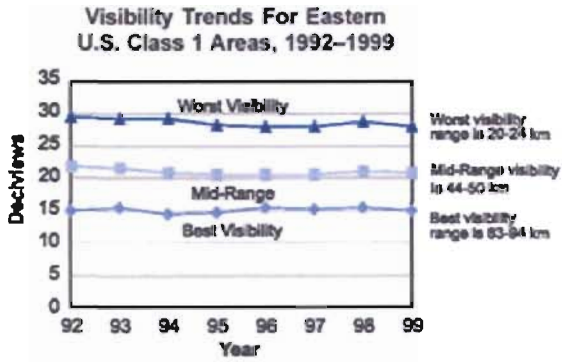
Visibility impairment[1] can be estimated from the following maps.



[1] http://www.epa.gov/air/airtrends/aqtrnd94/vis.html

Although the entire US is portrayed, it can be seen that visibility impairment in the central Florida area increased in 1980 relative to 1970, and then decreased in 1990 to the same approximate level as 1970.

A more recent table[2] shows that visibility improved in the eastern US between 1992 and 1999.



Ambient air quality trends near Sumter County, including ozone concentrations, were evaluated from the Department's Quick Look Reports from 1984 through 2004. Data was evaluated where available for Sumter County and the 6 contiguous counties (Citrus, Hernando, Lake, Marion, Pasco, and Polk). Data was used from nearby Orange County because suitable data was not available for Sumter County or the contiguous counties.

The data was used to chart the trend of concentrations of 5 criteria pollutants (PM_{10}, SO_2, CO, NOx, and O_3) at given monitors. In order to span numerous and recent years, monitoring data was used from Orange County. Please note that the data from these monitors are not being presented as necessarily representative of ambient air quality conditions at the site or in Sumter County. Rather, these data are from a nearby county and span enough time to show trends in ambient air quality. Suitable lead monitoring data was not identified.

The charts are included as an attachment to this response. Remarkably, all pollutants and averaging times indicate downward trends in ambient concentrations.

25. Please provide a detailed discussion of the truck traffic that will be generated from the construction and operation of the kiln. Some of this information has already been provided on your spreadsheets describing the road sources. Please show where the values of 6.8 for init lat and 1.84 for init vert came from in your spreadsheet describing the paved roads emissions estimation. Please discuss how the release height of 0 meters was chosen. Please provide a diagram showing each road segment, its location and its emission parameters.

Response: A detailed discussion of the truck traffic that will be generated from the operation of the kiln was included within the application as well as in the referenced

[2] http://www.epa.gov/air/airtrends/aqtrnd00/visible.html

spreadsheets. Truck traffic generated from the construction of the kiln will be transient and minimal when compared to the truck traffic generated during operation.

The values of 6.8 meters for the initial lateral dimension (init lat); 1.84 meters for the initial vertical dimension (init vert); and 0 meters for the release height were all developed in accordance with the *User's Guide For The Industrial Source Complex (Isc3) Dispersion Models Volume II - Description Of Model Algorithms.* The following text is taken from the User's Guide.

> "The ISC models use a virtual point source algorithm to model the effects of volume sources, which means that an imaginary or virtual point source is located at a certain distance upwind of the volume source (called the virtual distance) to account for the initial size of the volume source plume. There are two types of volume sources: surface-based sources, which may also be modeled as area sources, and elevated sources. An example of a surface-based source is a surface rail line. **The effective emission height for a surface-based source is usually set equal to zero**.
>
> The user also assigns initial lateral (σ_{yo}) and vertical (σ_{zo}) dimensions for the volume source. Lateral (x_y) and vertical (x_z) virtual distances are added to the actual downwind distance x for the σ_y and σ_z calculations. The virtual distances are calculated from solutions to the sigma equations as is done for point sources with building downwash.
>
> The north-south and east-west dimensions of each volume source used in the model must be the same. Table 1-6 summarizes the general procedures suggested for estimating initial lateral and vertical dimensions for single volume sources and for **multiple volume sources used to represent a line source**. In the case of a long and narrow line source such as a rail line, it may not be practical to divide the source into N volume sources, where N is given by the length of the line source divided by its width. The user can obtain an approximate representation of the line source by placing a smaller number of volume sources at equal intervals along the line source, as shown in Figure 1-8. In general, the spacing between individual volume sources should not be greater than twice the width of the line source.
>
> Figure 1-8 illustrates representations of a curved line source by multiple volume sources. Emissions from a line source or narrow volume source represented by multiple volume sources are divided equally among the individual sources unless there is a known spatial variation in emissions."

TABLE 1-6

SUMMARY OF SUGGESTED PROCEDURES FOR ESTIMATING
INITIAL LATERAL DIMENSIONS σ_{yo} AND
INITIAL VERTICAL DIMENSIONS σ_{zo} FOR VOLUME AND LINE SOURCES

Type of Source	Procedure for Obtaining Initial Dimension
(a) Initial Lateral Dimensions (σ_{yo})	
Single Volume Source	σ_{yo} = length of side divided by 4.3
Line Source Represented by Adjacent Volume Sources (see Figure 1-8(a))	σ_{yo} = length of side divided by 2.15
Line Source Represented by Separated Volume Sources (see Figure 1-8(b))	σ_{yo} = center to center distance divided by 2.15
(b) Initial Vertical Dimensions (σ_{zo})	
Surface-Based Source (h_e - 0)	σ_{zo} = vertical dimension of source divided by 2.15
Elevated Source (h_e > 0) on or Adjacent to a Building	σ_{zo} = building height divided by 2.15
Elevated Source (h_e > 0) not on or Adjacent to a Building	σ_{zo} = vertical dimension of source divided by 4.3

For this project, the roadway width is 24 feet. The dimensions of each volume source are therefore 24 feet by 24 feet (7.31 m x 7.31 m). The roadway was modeled using an approximate representation of a line source by multiple separated volume sources. As shown below in Figure 1-8, the spacing between the separated volume sources is twice the width of each volume source (14.63 m).

The initial lateral dimensions (init lat) for a line source represented by separated volume sources (see Figure 1-8(b)) is determined by dividing the center to center distance by 2.15.

14.63 m ÷ 2.15 = **<u>6.80 meters</u>**

The initial vertical dimensions (init vert) for a surface-based source (release height = 0 m) is determined by dividing the vertical dimension of source by 2.15. The vertical dimension of each volume source is the height of the trucks, assumed as 13 feet (3.96 m).

3.96 m ÷ 2.15 = **<u>1.84 meters</u>**

A diagram is included as an attachment to this response, showing each road segment, its location and its emission parameters.

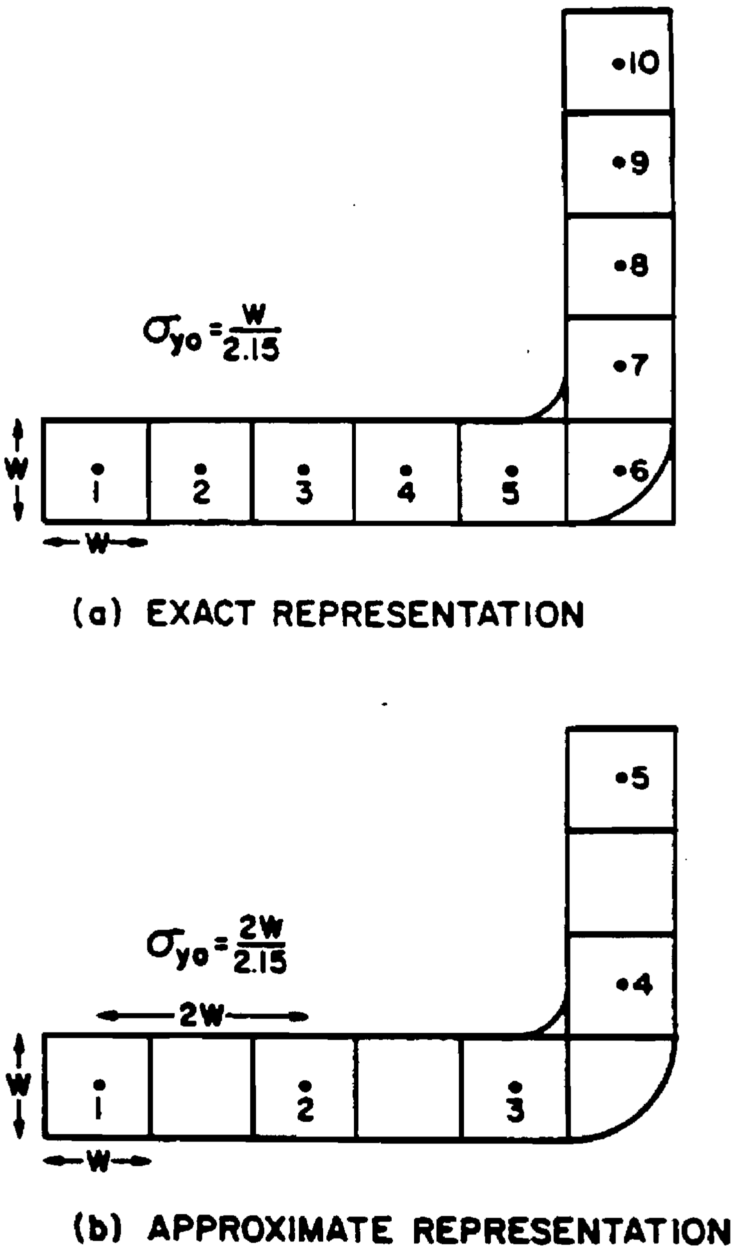


FIGURE 1-8. EXACT AND APPROXIMATE REPRESENTATIONS OF A LINE SOURCE BY MULTIPLE VOLUME SOURCES

26. The facility plot plan on page 11 does not show the dimensions and location of the buildings and structures on the property. Please provide a plot plan with UTM coordinates overlaid in a 100 meter grid showing the locations and the dimensions of the buildings and structures.

Response: The previously submitted facility plot plan showing dimensions and locations of proposed buildings and structures did not reproduce well. A revised plot plan with UTM coordinates overlaid in a 100 meter grid showing the locations and the dimensions of the buildings and structures is included as an attachment to this response.

27. Please provide a nitrogen deposition analysis for the Chassahowitzka PSD Class I area.

Response: The National Park Service (NPS) and the U.S. Fish and Wildlife Service (FWS) have developed criteria for evaluating the contribution of additional nitrogen (N) to deposition within Class I areas, titled *Guidance on Nitrogen and Sulfur Deposition Analysis Thresholds*.[3] The NPS and FWS have developed this DAT equation in response to requests by permitting authorities and permit applicants to continue to develop consistent, predictable permit review processes, and to expedite the permit review process. The FLMs have applied the 4% value used in Class I increment significant impact levels to these new deposition analysis thresholds. By incorporating this value into the DAT equations, new sources whose modeled deposition amounts are below the DATs are not likely to significantly contribute to cumulative impacts from N or S deposition.

A DAT is the additional amount of N deposition within a Class I area, below which estimated impacts from a proposed new or modified source are considered insignificant. The DAT for Chassahowitzka National Wildlife refuge was compared with the amount of additional deposition resulting from the Mabel Cement Plant, as modeled using CALPUFF. The N DAT represents total N, including both wet and dry deposition. Total nitrogen includes NO, NO2, HNO3, NO3, NH3, and NH4. Total N was selected in order to be consistent with conventions used in deposition loading, to represent the total amount of N inputs received in an ecosystem and to be compatible with CALPUFF model outputs.

The DAT for nitrogen in Eastern Class I parks and refuges is: 0.01 kg/ha/yr N.

Guidance for using the CALPUFF modeling system to estimate nitrogen deposition was obtained from *Guide for Applying the EPA Class I Screening Methodology with the CALPUFF Modeling System,* from Earth Tech, Inc., dated September 2001. The outputs for the previous CALPUFF runs included all concentrations and deposition fluxes written to binary files. The 5 CALPUFF runs, one for each year modeled (1986-1990), resulted

[3] http://www2.nature.nps.gov/air/Permits/flag/docs/N_SDATGuidance.pdf

in 5 sets of binary files. Each set included one file for the modeled concentrations, one file for the modeled dry deposition fluxes, and one file for the modeled wet deposition fluxes, calculated at every receptor, for each hour of the year. Using these files, the post-processing tasks included characterizing peak concentrations of several species for several averaging times (previously submitted), characterizing peak annual deposition rates of total nitrogen, and characterizing the change in visibility (previously submitted).

Prior to applying CALPOST to obtain the deposition outputs, POSTUTIL was used to consolidate the deposition fluxes. In particular, POSTUTIL was used to sum the wet and dry deposition fluxes into the total deposition flux of each species, and it converted various fluxes to the total nitrogen fluxes.

A CALMET file was not needed for this application because no nitrate partitioning was calculated. Two CALPUFF binary tiles were needed for this application: one for the dry deposition flux, and one for the wet deposition flux. Full years of 8760 hours (8784 hours for leap years) were processed in the screening assessments.

The 5 MESOPUFF II chemical transformation species were needed to compute the total nitrogen fluxes (the sum of the wet and dry fluxes):

- SO_2
- SO_4
- NO_X
- HNO_3
- NO_3

The postprocessing included the information required to compute the new species, using a weighted sum of the deposition fluxes of the stored species. Nitrogen mass is contributed by SO_4 (CALPUFF tracks ammonium sulfate as SO_4), NOx, HNO_3, and NO_3 (CALPUFF tracks ammonium nitrate as NO_3). The atomic weights for the constituent elements are sulfur = 32, oxygen = 16, nitrogen = 14, and hydrogen = 1. The molecular formula for ammonium sulfate is $(NH_4)_2S0_4$ and ammonium nitrate is $(NH_4)NO_3$. Therefore:

- 1 g of SO_4 contributes 0.291667 g of N
- 1 g of NOx contributes 0.304348 g of N
- 1 g of HNO_3 contributes 0.222222 g of N
- 1 g of NO_3 contributes 0.451613 g of N

The peak total nitrogen deposition flux was then estimated using CALPOST. The maximum total annual nitrogen deposition was for 1987, and was $2.0e^{-11}$ g/m2/sec. This is equivalent to 0.006 kg/ha/yr. As this value is less than the DAT for nitrogen in Eastern Class I parks and refuges of 0.01 kg/ha/yr, estimated impacts from the proposed new source are considered insignificant by the Federal Land Manager.

28. Please provide a table in Section 4 summarizing all of pollutant emission rates that were included in the Class I area PSD increment and visibility modeling.

Response: This response includes a table summarizing all of pollutant emission rates that were included in the Class I area PSD increment, visibility, and deposition modeling.

	Emission Rates (g/s)		
SRCNAME	SO2	NOx	PM10
BAG	0.00E+00	0.00E+00	9.62E-02
BIN	0.00E+00	0.00E+00	1.03E-02
BLEND1	0.00E+00	0.00E+00	9.92E-02
BLEND2	0.00E+00	0.00E+00	1.54E-02
BLEND3	0.00E+00	0.00E+00	1.78E-02
CEMENT1	0.00E+00	0.00E+00	9.47E-02
CEMENT2	0.00E+00	0.00E+00	9.47E-02
CEMENT3	0.00E+00	0.00E+00	2.57E-02
CLINKER1	0.00E+00	0.00E+00	2.06E-02
CLINKER2	0.00E+00	0.00E+00	2.20E-02
CLINKER3	0.00E+00	0.00E+00	2.37E-02
CLINKER4	0.00E+00	0.00E+00	2.37E-02
CLINKER5	0.00E+00	0.00E+00	2.06E-02
CLINKER6	0.00E+00	0.00E+00	2.06E-02
COAL1	0.00E+00	0.00E+00	1.48E-01
COAL2	0.00E+00	0.00E+00	1.89E-02
COOLER	0.00E+00	0.00E+00	1.26E+00
KILN	4.41E+00	3.07E+01	3.15E+00
MILL1	0.00E+00	0.00E+00	2.45E-01
MILL2	0.00E+00	0.00E+00	3.06E-02
MILL3	0.00E+00	0.00E+00	7.95E-01
RAW1	0.00E+00	0.00E+00	2.19E-02
RAW2	0.00E+00	0.00E+00	2.19E-02
RAW3	0.00E+00	0.00E+00	3.64E-02
RAW4	0.00E+00	0.00E+00	3.64E-02

29. Predicted impacts from all applicable PSD pollutants on soils, vegetation and wildlife should be included in the Additional Impact Analysis. In the application, the Additional Impact Analysis includes impacts to soils and vegetation from PM10 only. Please provide an analysis for the other PSD pollutants subject to review for this project. Please also include impacts to wildlife in your analysis.

Response: The applicable regulation, at Rule 62-212.400(5)(e), F.A.C., states in pertinent part that the owner or operator of the proposed facility or modification shall provide the Department with analyses of the impairment to soils and to vegetation having a significant commercial or recreational value, that would occur as a result of the facility or modification and associated commercial, residential, industrial and other growth. No mention is made of impacts to wildlife. Further, it was assumed that the pollutants that