

**FINAL**

**ENVIRONMENTAL JUSTICE ASSESSMENT FOR  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (REGION 2)  
CARBON MONOXIDE PSD PERMIT APPLICATION**

**RAVENA PLANT MODERNIZATION PROJECT**

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## **EXECUTIVE SUMMARY**

This environmental justice (EJ) analysis was performed in conjunction with the carbon monoxide (CO) PSD Air Permit Application to evaluate whether the Proposed Action's potential CO emissions would have any adverse and disproportionate impacts on minority and low-income populations. Since the PSD permit only relates to CO emissions, all adverse and disproportionate impacts were evaluated only as they pertain to CO. All other pollutants of concern will be addressed in the DEIS.

The basic steps in the EJ analysis are as follows:

1. Identify the affected populations and the Community of Concern (COC);
2. Identify significant adverse environmental impacts associated with the Project;
3. Determine whether any environmental impacts would be disproportionate in their distribution, affecting minority and/or low-income populations within the COC to a greater extent than populations that do not have their characteristics.

### Step 1 – Identify Affected Populations and the COC

Based on the NYSDEC/EPA EJ maps, the Project site is not located within a PEJ area. However, due to the Project's significant net emission increase for CO, a very conservative 20-mile COC, greater than the EPA recommended 1-mile radius, was delineated to identify the potential environmental justice (PEJ) areas within this radius. A PEJ area is a census block population that meets certain income and percent minority thresholds. Four PEJ areas (Albany, Cossackie, Troy, Hudson) were identified in New York and one PEJ area (Pittsfield) was identified in Massachusetts. The PEJ area in Massachusetts is outside the 20-mile COC radius yet was included to conservatively address nearby out-of-state PEJ area impacts.

In addition, federally recognized Indian Lands proximate to the site must also be considered when a facility is located within or near Indian country (even if owned and operated by non-Indians) or owned and operated by an Indian Nation. The Project Site is not owned or

operated by an Indian Nation and is over 95 miles from the nearest federally-recognized Indian Land - far from any significant Project impacts, accordingly, no Indian Lands are included in the COC for the purpose of this analysis.

### Step 2 – Identify Significant Adverse Environmental Impacts Associated with the Project

In this step, significant adverse CO impacts existing within the COC and future environmental burden associated with the proposed Project were identified. For CO, there are no PSD increments or impacts of concern in Class I areas (e.g., visibility impairment, sulfate/nitrate deposition). Therefore, the analysis focuses on compliance with the National Ambient Air Quality Standards (NAAQS) for CO and does not require use of a long distance transport model.

For existing conditions, the EPA has designated the entire state of New York and the Pittsfield, Massachusetts area as in attainment of CO NAAQS. Therefore, the COC and associated PEJ areas are in compliance with NAAQS established to protect the public health and environment, and existing ambient air CO levels are not considered a significant environmental burden. For comparative purposes, the Loudonville CO monitoring station's second highest 1-hour and 8-hour observations for 2007 were 4% and 10%, respectively, of their corresponding NAAQS limits.

Determining the COC and corresponding PEJ areas' environmental burden relating to the proposed Project was evaluated using the modeling procedure reported in the Air Dispersion Modeling Report for Air Permit Application – Ravenna Plant Modernization Project. In this procedure, the net emission increase of CO emissions associated with the Project was evaluated using an EPA-approved dispersion modeling procedure. Albany Airport meteorological data from 2003 through 2007 was used with both Albany and Ravenna surface characteristics in order to conservatively account for differences in surface conditions between the Albany Airport monitoring site and the Project site. A 100% maximum load and a 75% load condition were modeled. The 75% load condition was used to represent an operational condition that could result in stack parameters with poorer dispersion characteristics. The highest 1-hour and 8-hour concentrations were used to determine the net CO concentration changes (new kiln concentrations minus old kiln concentrations) relative to the CO significant impact levels (SILs)

set at 5% of the NAAQS. The SIL's for CO were not exceeded for either the "full load" or the 75% load scenario and thus no additional modeling analysis for CO is required. Therefore Project related CO impacts are considered insignificant and do not pose a significant environmental burden.

Additionally, no adverse effects on soils, vegetation, growth impacts or visibility are expected as a result of the Project. No sensitive soils or vegetation types known to exist within the COC. The Project will not create any additional permanent jobs or require any change in public infrastructure. Only temporary construction and vendor jobs will be created. CO is a colorless gas and thus has no impacts on visibility.

### Step 3 – Determination of Disproportionate PEJ Area Impacts

Model results comparing the PEJ area impacts (percentage of maximum modeled concentration) to the non-PEJ area impacts (percentage of maximum modeled concentration) are reported. The 1-hour and 8-hour maximum modeled impacts both occur within the COC in a non-PEJ area located approximately 4.3 miles (6.9 km) northwest from the kiln stack. Modeled CO concentrations for all five corresponding PEJ areas (Rensselaer, Albany, Greene, Columbia Counties in New York State and Pittsfield, Massachusetts) are lower than the modeled non-PEJ areas noted (PBC Elementary, RCS High School and AW Becker Elementary). In the COC, the maximum modeled impacts are higher in the non-PEJ areas as compared with the five PEJ areas. As demonstrated by this analysis, the proposed Project's CO emissions will not cause a disproportionate impact to the PEJ areas within the COC.

As a result of this analysis, no adverse or disproportionate PEJ area impacts are predicted, therefore, the Project will follow standard public participation and permitting procedures.

## **1.0 INTRODUCTION**

### **1.1 Background**

On February 11th, 1994, President Clinton issued Executive Order 12898 entitled “Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.” The intent of this Executive Order is to require that each federal agency, to the maximum practicable extent, make achieving environmental justice (EJ) a part of its mission by identifying and addressing, where appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. Accordingly, the federal agencies involved in the Ravena Modernization Project have developed policy guidance for complying with this Executive Order. The New York State Department of Environmental Conservation (NYSDEC) has adopted a similar procedure to address environmental justice for certain state actions. This document has been prepared as part of the environmental justice assessment of the Ravena Plant Modernization Project (Project). Proposed actions at the federal level that require this analysis include a United States Environmental Protection Agency (EPA) Carbon Monoxide (CO) Prevention of Significant Deterioration (PSD) Air Permit Application. The analysis has been prepared in accordance with EPA Region 2 Interim EJ Policy. This procedure is consistent with EJ analysis methodologies that have been developed for state actions.

### **1.2 Project Description**

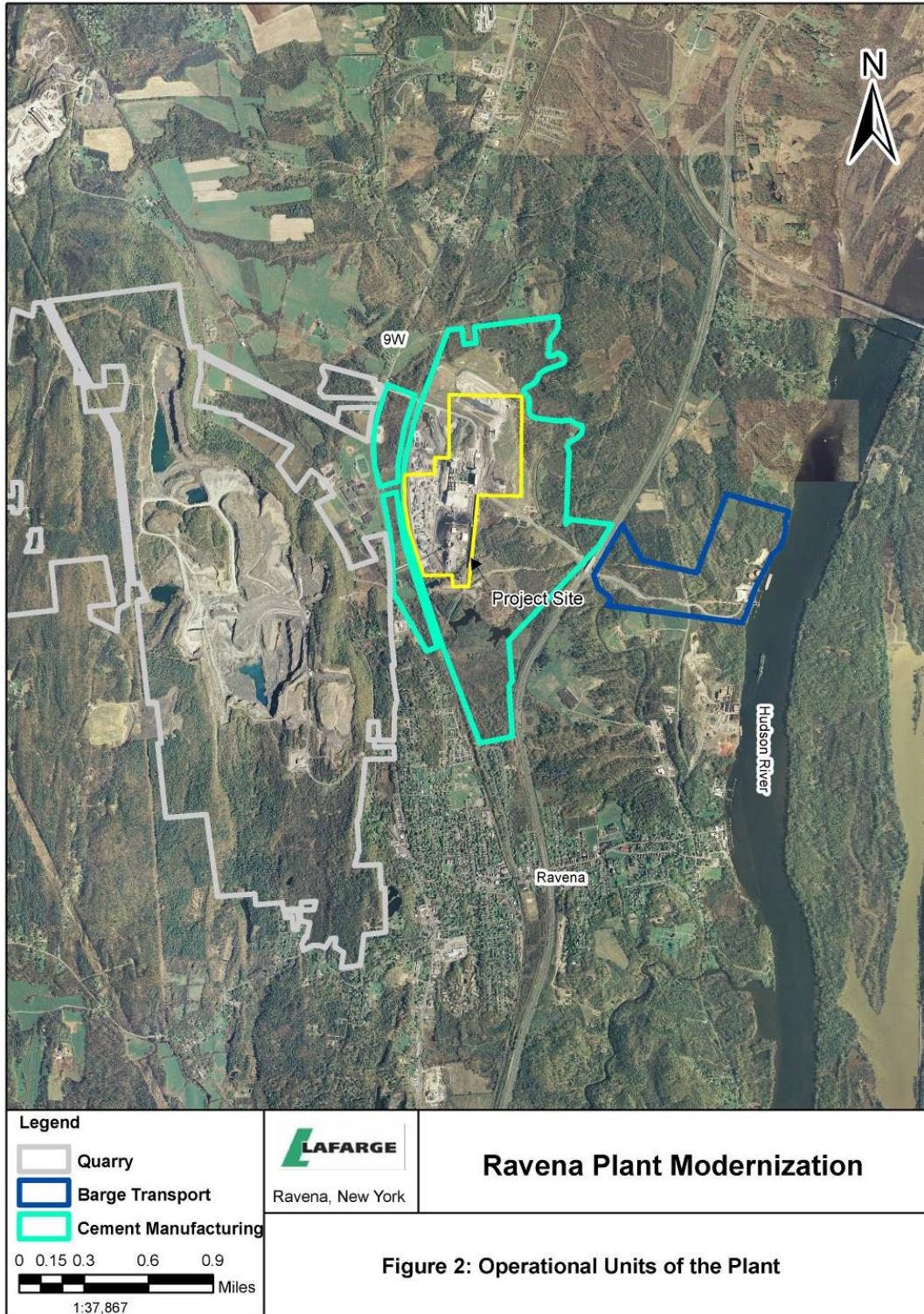
Lafarge Building Materials, Inc. (Lafarge) is proposing to modernize its cement manufacturing facility in the Town of Coeymans, New York (commonly known as the Ravena Plant). The Ravena Plant is located on Route 9W, approximately 10 miles south of Albany, New York (Figure 1). The plant occupies an approximately 750-acre site within an approximately 3,274 contiguous acre property that Lafarge owns East and West of Route 9W. The 3,274 acre site includes a limestone quarry, a cement manufacturing plant, a conveying system for material movement to and from the plant including the docking and loading facilities on the Hudson River. The remaining Lafarge property is undeveloped. There is also a 65 acre portion of the



Lafarge property that is leased to Callanan Industries for their stone aggregate operations. The Project Site that would be dedicated to the new modernized facilities is, approximately 189 acres, and would be located within the existing manufacturing operations. Figure 2 shows the Site location on an aerial photograph.

The elements of the proposed Project include the construction and operation of a new dry process preheater/precalciner kiln and clinker cooler operation. An eventual replacement and/or upgrade of existing cement grinding mills is also planned. All emissions from the kiln system, including the alkali bypass and the clinker cooler, will be vented to the atmosphere through the main kiln stack. There are no proposed physical changes in the quarry operation that are associated with the plant modernization. The mode of transportation of raw materials or finished product coming in or out of the plant including the existing barge loading operation will also remain unchanged from existing plant operations. Production capacity is expected to increase from 6,000 to 8,818 tons per day (tons/day) and from 1.88 to 2.81 million tons per year (tons/yr) of clinker as a result of the modernization. Fuels approved for use in the current facility include coal, petroleum coke, fuel oil (virgin or used), whole or chipped tires and natural gas. No change in allowable fuels is proposed. The use of any other fuels to fire the kiln would be subject to additional solid waste and air permitting regulatory approval. The raw materials for clinker production may include, but are not limited to, limestone rock, bauxite, bottom ash and/or fly ash, iron, and other similar materials. Synthetic or natural gypsum and limestone will be milled with the clinker to produce cement.

The modernization project is planned as a phased construction project. The first phase, which includes the installation of the new kiln/cooler system, is expected to be completed by the end of 2014. The remaining phases are expected to be completed within 4 years of startup of the new kiln system. As required by the Federal Prevention of Significant Deterioration rules at 40 CFR 52.21, construction will commence within 18 months of approval and construction will not be discontinued for more than 18 months between phases.



### **1.3 Scope of the EPA PSD Permit Application and Applicability of Environmental Justice Analysis**

As indicated in the Netting Analysis (Tab E) for the Air Permit Application, the Project results in a significant net increase only for CO. Therefore, the facility is subject to the EPA PSD requirements for CO only. Since the Proposed Action is subject to an EPA CO PSD permit, it is also subject to the EPA's environmental justice requirements and evaluation procedures. The EPA's environmental justice analysis procedure is provided in EPA Region 2 Interim Environmental Justice Policy, dated December 2000.

As set forth in the EPA's Region 2 Interim EJ Guidance, the basic steps in the EJ analysis are as follows:

1. Identify the affected populations and the Community of Concern (COC);
2. Identify the significant adverse environmental impacts associated with the Project (also known as an environmental burden); and
3. Determine whether any environmental impacts would be disproportionate in their distribution, affecting minority and/or low-income populations within the COC to a greater extent than populations that do not have their characteristics.

A discussion of each of these steps in the EJ evaluation process can be found in Section 2 below. Since this EJ Analysis is submitted as part of the CO PSD Permit Application, the environmental impacts evaluated as part of this analysis will be limited to CO. All other impacts of concern are addressed in the Draft Environmental Impact Statement (DEIS) being prepared for the Project pursuant to New York State's State Environmental Quality Review Act (SEQRA) and will follow the NYSDEC EJ guidance as provided in Commissioner's Policy 29 (CP-29).

## **2.0 ENVIRONMENTAL JUSTICE ANALYSIS**

The purpose of this environmental justice analysis is to determine whether the increase in CO emissions would have a disproportionate impact on minority and low-income populations when compared to the effect on other populations in the COC. These populations have been identified in accordance with criteria found in CP-29, and mapped throughout the State, as Potential

Environmental Justice (PEJ) areas. The EPA uses the term COC to refer to a community that is the subject of an EJ analysis. The EPA's EJ guidance also requires identification of Federal Indian lands in close proximity to the Project site.

Pursuant to the Executive Order and subsequent EPA EJ guidance, the three basic steps of the EJ analysis provide guidelines for conducting consistent evaluations to define a COC and identify any PEJ areas, to determine if an environmental burden or impact exists, and to then determine if there are disproportionately high and adverse impacts to these PEJs within the COC. The three steps of the EJ analysis as they relate to CO are described in detail below.

## **2.1 Identification of Affected Populations (Community of Concern)**

### **2.1.1 Community of Concern Analysis Methodology**

The first step in the analysis of environmental justice is to develop geographic boundaries which will define the COC. The EPA EJ guidance states that there are a number of different sources for the demographic information that form the basis of the analysis. U.S. Census block group data includes the racial and ethnic composition and relative income distribution information required for PEJ area designation. Therefore, for purposes of this study, the EJ database maintained by the NYSDEC was used since it classifies areas using census block groups and uses the same demographic thresholds required by EPA in EJ studies.

The NYSDEC EJ database provides a comprehensive state-wide GIS that maps areas that qualify as PEJ areas based on U.S. Census data on a census block level. As defined by the NYSDEC, an urban or non-rural area with a minority population greater than 51.1% and/or with 23.59% of the household incomes below the federal poverty level is considered a PEJ area. If Project effects are in or near a PEJ area, a determination must be made as to whether potential adverse environmental impacts related to the Proposed Action are likely to affect the PEJ. As noted above, these demographic thresholds are used and accepted by the NYSDEC as well as the EPA.

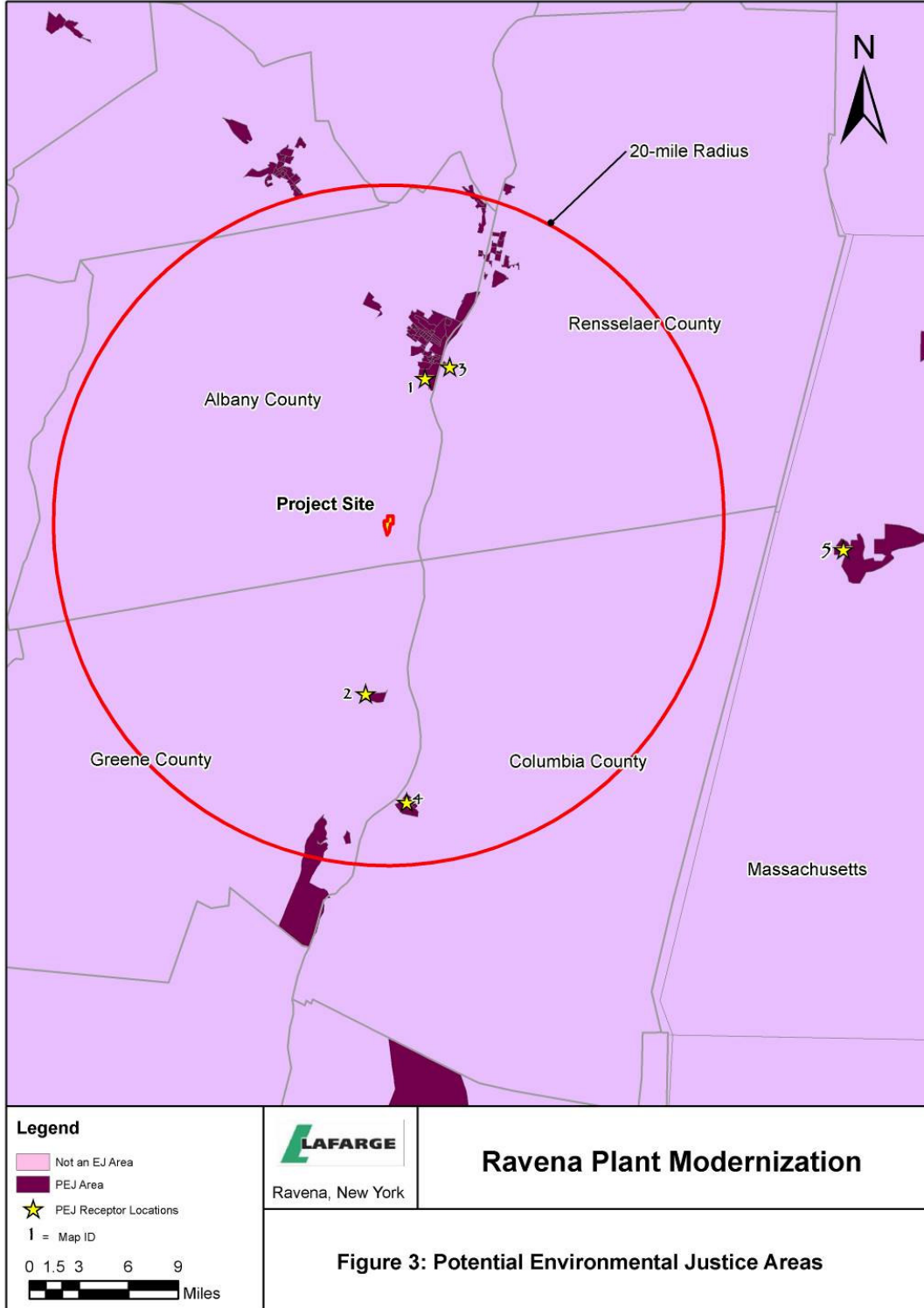
Due to the potential for air quality impacts downwind of the facility and the facility's proximity to the Massachusetts boarder, the nearest PEJ areas in Massachusetts were also identified. Environmental Justice Criteria in Massachusetts for Income is households earning 65% or less of statewide median household income; for Minority Population, 25% or more of residents belonging to a minority group. The EJ database maintained by Massachusetts was used for identifying PEJ areas located within that state.

Finally, pursuant to the EPA interim EJ guidance, federally recognized Indian Lands proximate to the site must also be considered. The EPA Region 2 EJ guidance states that "whenever a potential enforcement action involves a federally-recognized Indian Nation in any way, the EJ guidance should be referenced and enforcement staff should be advised that appropriate Agency guidance must be followed to ensure that EPA acts consistent with its trust responsibility and "government-to-government" relationship with the Indian Nations." This guidance applies when a facility is:

- Located within or near Indian country (even if owned and operated by non-Indians); and
- Owned and operated by an Indian Nation.

#### 2.1.2 Community of Concern Analysis Results

Based on the NYSDEC/EPA EJ maps, the Project site is not located within a PEJ area. The closest qualifying PEJ areas in relation to the Project site are depicted in Figure 3. As seen in Figure 3, the plant site is located more than 8 miles from areas identified by NYSDEC/EPA as having characteristics that would warrant an EJ analysis. However, to ensure that Project related CO impacts are appropriately addressed, the COC for this Project has gone beyond the EPA-recommended 1-mile radius and includes PEJ areas identified within 20 miles of the Project site. This extended study area was chosen for a few reasons. First, kiln stack emission dispersion characteristics often produce impacts well outside the EPA-recommended 1-mile radius. Second, that the maximum modeled 1-hour CO concentration, as noted later, is located some 4.3 miles (6.9 km) away from the facility, outside the EPA-recommended 1-mile radius and should be included within the COC. Third, to further demonstrate that PEJ area impacts with different orientation (i.e., PEJ areas located north-northeast versus south of the Project site) diminish as distance from the Project site increase. Fourth, to perform an exhaustive and very conservative CO impact EJ analysis.



All areas defined as PEJ and non-PEJ are based on the above stated demographic thresholds for each census block group in the COC. Overall, the majority of the 20-mile COC area does not trigger NYSDEC/Federal EPA thresholds set forth in the EJ guidance for both race and income when compared with the aforementioned thresholds. As indicated in Figure 3, those PEJ areas identified within 20 miles of the Project site are located north-northeast and south of the Project site. In order to evaluate the worst-case impact of the facility, the two closest PEJ areas were further selected (see Table 1) and modeled for CO impacts (see Section 2.2.2). This approach was applied since the closest PEJ areas would receive the highest CO emission impacts, with diminishing impacts as distance from the Project site increase. Should the modeling indicate a potential for any of these PEJ areas to receive significant impacts, additional PEJ areas located further away would be added to the analysis. As noted above, the nearest PEJ areas in Massachusetts were also identified (see Figure 3) and were found in the northwestern section of the state. The nearest PEJ area in Massachusetts is in Pittsfield. This PEJ satisfied both income and minority population EJ requirements based on Massachusetts EJ criteria. The PEJ in Pittsfield is located 26 miles away from the Project site, well outside of the COC, yet, was included to evaluate the impacts for the nearest out-of-state PEJ area.

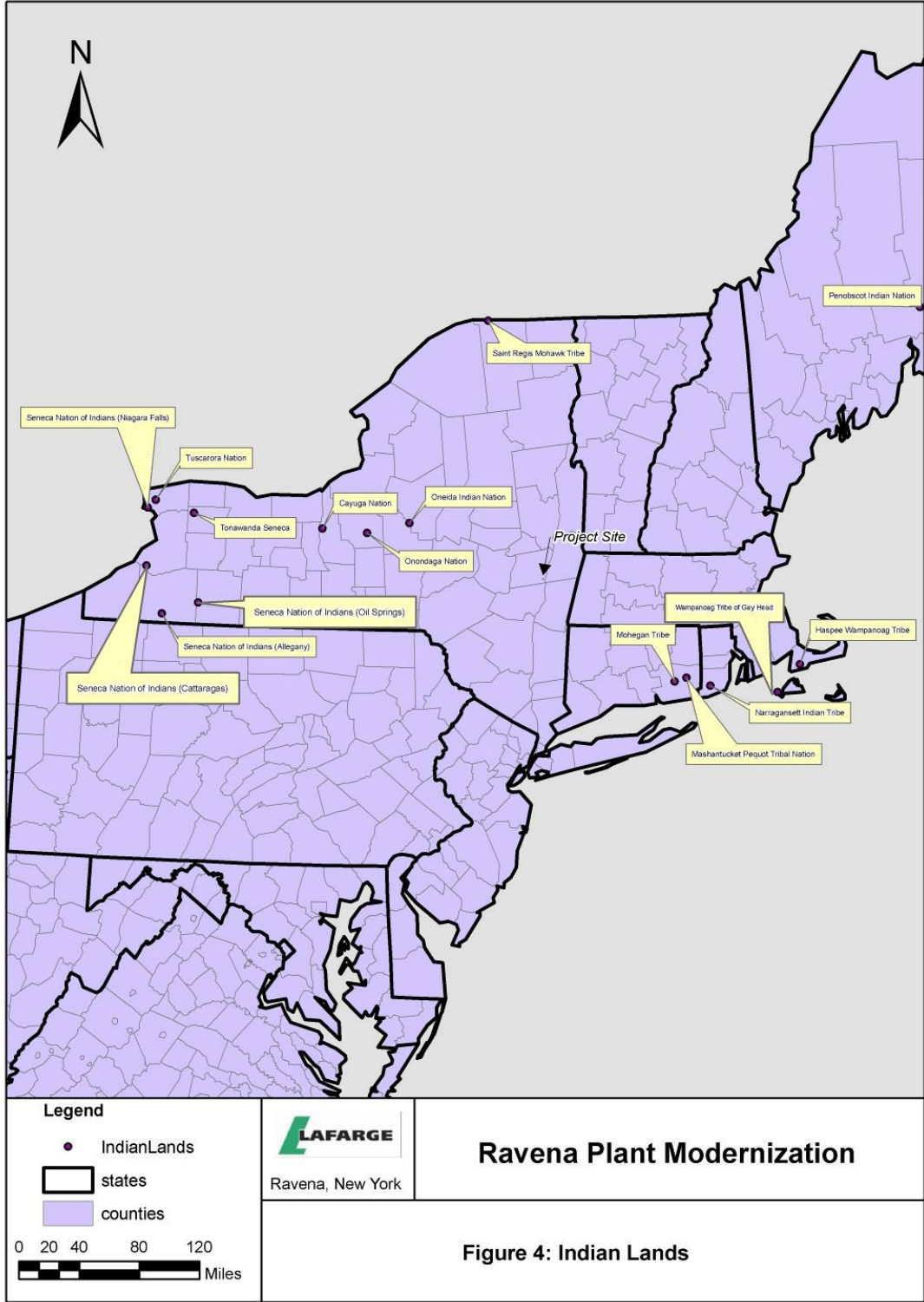
Table 1 describes the five modeled PEJ areas for which modeling was conducted, listing their locations, distance from the Project site and includes the census tract which each PEJ block group falls within.

Finally, as identified in Figure 4, the EPA has identified ten Indian Lands in New York State (EPA Region 2) and ten Indian Lands in New England (EPA Region 1) whose proximity to the site must be considered. Table 2 lists the federally-recognized Indian Lands in EPA Regions 1 and 2. As shown in this table, the nearest Indian Land in Region 1 is the Mohegan Tribe, which is over 110 miles southeast of the Project site. The nearest Indian Land in Region 2 is the Oneida Nation, located over 95 miles west north-west of the Project site. Since the Project Site is not owned or operated by an Indian Nation, is over 95 miles from the closest federally-recognized Indian Land – far from any significant Project impacts, no Indian Lands are included in the COC for the purpose of this EJ analysis.

**Table 1**  
**Potential Environmental Justice Areas**

<b>PEJ Area</b>	<b>Map ID</b>	<b>NY County or State</b>	<b>Distance from Project Site (miles)</b>	<b>Description (PEJ Census Tract Number)</b>
Albany	1	Albany	8.6	1,2,3,4,04,5.1,5.2,6,7,8,14,15,16,20,21,23,25,26,136.02
Coxsackie	2	Greene	9.7	808
Troy	3	Rensselaer	9.7	515
Hudson	4	Columbia	16.2	9912 and 9913
Pittsfield	5	Massachusetts	26.4	*

\*Source: Massachusetts Geographic Information System  
(<http://www.mass.gov/mgis/massgis.htm>)



**Table 2  
Indian Lands in USEPA Regions 1 and 2**

<b>Name</b>	<b>State</b>	<b>EPA Region</b>	<b>Distance from Project Site (miles)</b>
Mohegan Tribe	Connecticut	1	110.9
Mashantucket Pequot Tribal Nation	Connecticut	1	115.7
Narragansett Indian Tribe	Rhode Island	1	131.8
Wampanoag Tribe of Gay Head	Massachusetts	1	173.1
Haspee Wampanoag Tribe	Massachusetts	1	180.0
Penobscot Indian Nation	Maine	1	308.6
Aroostook Band of Micmacs	Maine	1	418.4
Houlton Band of Malisee Indians	Maine	1	389.9
Pasamaquoddy Tribe of Indians-Pleasant Point	Maine	1	378.8
Pasamaquoddy Tribe of Indians-Indian	Maine	1	365.1
Saint Regis Mohawk Tribe	New York	2	174.8
Oneida Indian Nation	New York	2	95.7
Onondaga Nation	New York	2	120.4
Cayuga Nation	New York	2	149.9
Tonawanda Seneca	New York	2	235.6
Tuscarora Nation	New York	2	262.1
Seneca Nation of Indians (Oil Spring)	New York	2	229.2
Seneca Nation of Indians (Allegany)	New York	2	253.9
Seneca Nation of Indians (Cattaraugus)	New York	2	263.1
Seneca Nation of Indians (Niagara Falls)	New York	2	266.5

## **2.2 Identification of Significant Adverse Impacts (Environmental Burden)**

### **2.2.1 Environmental Burden Analysis Methodology**

Once the COC and PEJ areas are identified, the next step is to identify significant adverse CO impacts (the environmental burden) existing within the COC and future environmental burden with the proposed Project. As noted above, this EJ Analysis has been prepared to support the EPA CO PSD Permit Application and accordingly, addresses only CO impacts.

The existing environmental burden of a community can be represented by the concept of an environmental load profile (ELP). This profile is based on salient characteristics that serve as indicators of environmental burden and provide a consistent basis for comparison. The profile of the COC is compared to that of the statistical reference area (PEJ area) and the salient characteristics (i.e. indicators such as attainment or non-attainment of CO ambient air quality standards) are used to assess whether the PEJ is experiencing a disproportionately high and adverse burden.

EPA Region 2 EJ guidance suggests using ambient air quality mapping (attainment/non-attainment designation) for determining environmental burdens relating to CO. The EPA's air quality data – i.e., as characterized from the collection of data from CO and other monitoring stations throughout the Region, are mapped using a GIS tool. Spatial interpolation is used to estimate the concentration values in areas between ambient monitoring stations for determination of compliance with ambient air quality standards. If necessary, the boundaries of a COC can be drawn to determine if the COC is within a non-attainment area for CO.

In addition, the environmental burden analysis must also include impacts resulting from the proposed Project. To satisfy this requirement, dispersion modeling of the main kiln stack was performed in accordance with an EPA-approved modeling protocol (see Air Dispersion Modeling Report for Air Permit Application, Ravenna Plant Modernization Project).

For CO, there are no PSD increments or impacts of concern in Class I areas (e.g., visibility impairment, sulfate/nitrate deposition)<sup>1</sup>. Therefore, the analysis focuses on compliance with the National Ambient Air Quality Standards (NAAQS) for CO and does not require use of a long distance transport model. With respect to the preconstruction monitoring requirements of 40 CFR 52.21 (m), Lafarge proposed using the background monitoring data from the NYSDEC monitoring station in Loudonville, located approximately 19 miles from the Ravenna plant. Data available from this station from 1997 through 2007 meet minimum data requirements and have been determined by NYSDEC to be representative for previous PSD permitting projects in the area.

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<sup>1</sup> See Attachment 1: Federal Land Manager Review Applicability letter

The PSD CO analysis procedure includes preliminary assessment methodology designed to determine if the PSD significant impact levels (SIL) or the significant monitoring concentrations (SMC) at 40 CFR 52.2(i)(5) for CO are exceeded due to the net emission increase of the Project. The 1-hour and 8-hour CO SILs of 2,000  $\mu\text{g}/\text{m}^3$  and 500  $\mu\text{g}/\text{m}^3$ , respectively, are based on 5% of their corresponding CO NAAQS. As stated in the EPA-approved modeling protocol, if the SILs are not exceeded, no further analysis for CO will be required since all impacts would be less than 5% of the CO NAAQS and are therefore deemed insignificant. As noted in the following section, the 1-hour and 8-hour CO SILs were not exceeded, therefore further analysis was not required. However, a qualitative statement concerning soils and vegetation, growth induced and visibility impacts is provided below.

## 2.2.2 Environmental Burden Analysis Results

### 2.2.2.1 *Air Quality Impacts*

The EPA determines attainment/non-attainment CO ambient air quality standards based on the compilation of data from the network of ambient air CO monitoring stations throughout the Region. Based on this data, the EPA has designated the entire state of New York and the Pittsfield, Massachusetts area as in attainment of CO NAAQS. Therefore, the COC and associated PEJ areas are in compliance with NAAQS established to protect the public health and environment, and existing ambient air CO levels are not considered a significant environmental burden. For comparative purposes, the Loudonville CO monitoring station's second highest 1-hour and 8-hour observations for 2007 were 4% and 10%, respectively, of their corresponding NAAQS limits.

Determining the COC and corresponding PEJ areas' environmental burden relating to the proposed Project was evaluated using the modeling procedure noted earlier and reported in the Air Dispersion Modeling Report for Air Permit Application – Ravenna Plant Modernization Project. In this procedure, the net emission increase of CO emissions associated with the Project was evaluated using an EPA-approved dispersion modeling procedure. Albany Airport meteorological data from 2003 through 2007 was used with both Albany and Ravenna surface

characteristics in order to conservatively account for differences in surface conditions between the Albany Airport monitoring site and the Project site. A 100% maximum load and a 75% load condition were modeled. The 75% load condition was used to represent an operational condition that could result in stack parameters with poorer dispersion characteristics. The highest 1-hour and 8-hour concentrations were used to determine the net CO concentration changes (new kiln concentrations minus old kiln concentrations) relative to the CO SILs. As shown in Tables 3 and 4, the SIL's for CO were not exceeded for either the "full load" or the 75% load scenario and thus no additional modeling analysis for CO is required. Therefore Project related CO impacts are considered insignificant and do not pose a significant environmental burden.

#### *2.2.2.2 Additional Environmental Burden Results*

Even though the SIL's for CO were not exceeded, PSD review requires an analysis of any potential impairment to visibility, soils, and vegetation that may occur as a result of the proposed Ravenna sources. The review also requires an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with the proposed Project.

##### *2.2.2.2.1 Soils and Vegetation*

No sensitive soil types are known to exist within the COC. Moreover, the areas of maximum impact are generally cultivated or forested and demonstrate no obvious sensitivity to industrial air emissions.

The Project will not result in a significant net increase in any PSD-regulated pollutant except for CO. For several pollutants (e.g., SO<sub>2</sub>, NO<sub>x</sub> and PM<sub>2.5</sub>), there will be significant decreases. For CO, there will not be a significant air quality increase (i.e., the SIL for CO is not exceeded). Thus, no adverse effects on soils or vegetation are expected as a result of the Project.

**Table 3**  
**Summary of CO Significant Impacts at “Full Load”**

**Met Data Set:** *Albany Airport with Albany Surface Characteristics*

<b>Year</b>	<b>Highest 8-hour Concentration µg/m<sup>3</sup></b>	<b>Distance to Significant 8-hour Impact km</b>	<b>Highest 1-hour Concentration µg/m<sup>3</sup></b>	<b>Distance to Significant 1-hour Impact km</b>
2003	20	NA	128	NA
2004	23	NA	162	NA
2005	25	NA	148	NA
2006	21	NA	130	NA
2007	20	NA	122	NA
Allowable Significant Level	500	Anywhere offsite	2,000	Anywhere offsite
NAAQS	10,000		40,000	

**Met Data Set:** *Albany Airport with Ravenna Surface Characteristics*

<b>Year</b>	<b>Highest 8-hour Concentration µg/m<sup>3</sup></b>	<b>Distance to Significant 8-hour Impact km</b>	<b>Highest 1-hour Concentration µg/m<sup>3</sup></b>	<b>Distance to Significant 1-hour Impact km</b>
2003	19	NA	114	NA
2004	20	NA	140	NA
2005	23	NA	129	NA
2006	19	NA	117	NA
2007	21	NA	128	NA
Allowable Significant Level	500	Anywhere offsite	2,000	Anywhere offsite
NAAQS	10,000		40,000	

**Table 4**  
**Summary of CO Significant Impacts at 75% Load**

**Met Data Set: Albany Airport with Albany Surface Characteristics**

<b>Year</b>	<b>Highest 8-hour Concentration µg/m<sup>3</sup></b>	<b>Distance to Significant 8-hour Impact km</b>	<b>Highest 1-hour Concentration µg/m<sup>3</sup></b>	<b>Distance to Significant 1-hour Impact km</b>
2003	14	NA	95	NA
2004	15	NA	107	NA
2005	19	NA	111	NA
2006	17	NA	101	NA
2007	16	NA	97	NA
Allowable Significant Level	500	Anywhere offsite	2,000	Anywhere offsite
NAAQS	10,000		40,000	

**Met Data Set: Albany Airport with Ravenna Surface Characteristics**

<b>Year</b>	<b>Highest 8-hour Concentration µg/m<sup>3</sup></b>	<b>Distance to Significant 8-hour Impact km</b>	<b>Highest 1-hour Concentration µg/m<sup>3</sup></b>	<b>Distance to Significant 1-hour Impact km</b>
2003	13	NA	80	NA
2004	14	NA	89	NA
2005	18	NA	97	NA
2006	16	NA	93	NA
2007	15	NA	91	NA
Allowable Significant Level	500	Anywhere offsite	2,000	Anywhere offsite
NAAQS	10,000		40,000	

#### 2.2.2.2.2      Growth Impacts

A growth analysis includes a projection of the associated industrial, commercial, and residential source growth that will occur in the area due to the source. Lafarge estimates that the Project will not create additional permanent jobs onsite nor will the Project require any changes in the public infrastructure. During the 36 to 42 month (approximate) construction phase, there will be a maximum of 700 to 800 construction jobs and 506 temporary jobs for local vendors of construction materials and professional services.

Lafarge estimates that once operational, there will be about 61,574 truck trips to and from the plant per year. The secondary emissions related to the Project, which under the PSD rules do not include mobile source tailpipe emission, are not expected to have an adverse impact on local ambient air quality.

#### 2.2.2.2.3      Visibility

CO is a colorless gas and thus has no impacts on visibility. With respect to visibility impacts due to condensed water vapor, the current wet cement process at Ravenna results in a visible water vapor plume under certain atmospheric conditions which is a function of ambient temperature, relative humidity, and barometric pressure. The existing kiln exhaust gases contain approximately 30 percent water and exit the kiln stack at approximately 350°F. Once the exhaust gases cool below the condensation point, a vapor plume forms and continues downwind until the plume is diluted and dispersed so that the water droplets are converted back to the vapor phase. Because of the high moisture content of the kiln stack exhaust, the visible plume can be quite long under high humidity atmospheric conditions.

If a wet scrubber is used to control sulfur dioxide emissions from the dry process kiln, the exhaust gases will be fully saturated but at a much lower temperature than the existing kiln gases. Because the cooler gas stream cannot hold as much moisture, the exhaust gas would only have approximately 13 percent moisture.

Thus, the frequency and length of a visible water vapor plume will be less for the new kiln system than the existing process. If Lafarge chooses an alternative control system, the visible vapor plume would be further reduced or even eliminated. In addition, any visible vapor plume would not be as close to the ground, because the existing kiln stack is 350 feet tall and the new kiln stack will be approximately 525 feet tall.

## **2.3 Determination of Disproportionate and Adverse Impacts**

### 2.3.1 Disproportionate and Adverse Impacts Analysis Methodology

As noted in the previous subsection, existing ambient air CO levels comply with the NAAQS established for CO, modeled Project related CO emission impacts are well below the CO SILs, are considered insignificant and pose no adverse environmental burden to the COC and associated PEJ areas. In addition, CO attainment for both PEJ and non-PEJ areas indicate that there is no disproportionate existing environmental burden with respect to CO ambient air quality within the COC. However, the EPA EJ guidance also requires a determination whether the Project would cause a disproportionate environmental burden.

Disproportionate CO air quality impacts occur when project related emissions disproportionately impact one or more PEJ areas when compared to other non-PEJ areas within the COC. The EPA-approved CO modeling procedure used for the SIL analysis in Section 2.2 above is also used for comparing PEJ area impacts with non-PEJ area impacts within the COC. The CO impacts within the five PEJ areas, identified in Section 2.1, are compared to both the maximum modeled CO impact within the COC as well as other select non-PEJ area sensitive receptors. The non-PEJ area sensitive receptors selected include Peter B. Coeymans Elementary, Ravena-Coeymans-Selkirk High School and AW Becker Elementary. The five PEJ area receptor locations are listed below by the cross street nearest to the Project site:

1. Town of Bethlehem, Albany County: State Highway 32 and Binghamton Street
2. Town of Coxsackie, Green County: US 9W and County Route 9
3. City of Rensselaer, Rensselaer County: Ring Street and 2nd Avenue

4. City of Hudson, Columbia County: South 2nd Street and Partition Street
5. Pittsfield, Massachusetts, Lakeway Drive and Vin Hebert Boulevard

### 2.3.2 Disproportionate and Adverse Impacts Analysis Results

Model results comparing the PEJ area impacts (percentage of maximum modeled concentration) to the non-PEJ area impacts (percentage of maximum modeled concentration) are provided in Table 5. The 1-hour and 8-hour maximum modeled impacts both occur within the COC in a non-PEJ area located approximately 4.3 miles (6.9 km) northwest from the kiln stack. Modeled CO concentrations for all five corresponding PEJ areas (Renesselaer, Albany, Greene, Columbia Counties in New York State and Pittsfield, Massachusetts) are lower than the modeled non-PEJ areas noted (PBC Elementary, RCS High School and AW Becker Elementary). In the COC, the maximum modeled impacts are higher in the non-PEJ areas as compared with the five PEJ areas. As demonstrated by this analysis, the proposed Project's CO emissions will not cause a disproportionate impact to the PEJ areas within the COC.

**Table 5**  
**CO Impact Analysis Summary for PEJ/Sensitive Areas**

Averaging Period	Maximum Modeled ( $\mu\text{g}/\text{m}^3$ )	Distance to Max Conc. (km)	PEJ & Non-PEJ Sensitive Receptors (Percentage of Maximum Modeled Concentration)							
			PEJ Rensselaer County	PEJ Albany County	PEJ Greene County	PEJ Columbia County	PEJ Pittsfield, MA	Non-PEJ PBC Elementary	Non-PEJ RCS High School	Non-PEJ AW Becker Elementary
1-hr	141	6.9	9.09%	9.64%	11.97%	7.43%	10.79%	27.41%	17.59%	19.14%
8-hr	26	6.9	13.47%	17.84%	22.48%	19.23%	10.15%	39.78%	30.64%	37.79%

**NOTES:**

New CO sources only (kiln and Finish Mill #5)

Worst case met data was processed with Albany surface characteristics

Based on "full load" conditions (operating at 100% of capacity and at maximum permitted emission rate)

### **3.0 CONCLUSION/SUMMARY OF RESULTS**

This environmental justice analysis was performed in conjunction with the CO PSD Air Permit Application to evaluate whether the Proposed Action's potential CO emissions would have any adverse and disproportionate impacts on minority and low-income populations. Since the PSD permit only relates to CO emissions, all adverse and disproportionate impacts were evaluated only as they pertain to CO. All other pollutants of concern will be addressed in the DEIS. A 20-mile COC, greater than the EPA recommended 1-mile radius, was delineated to identify the PEJ areas within this radius. Four PEJ areas (Albany, Coxsackie, Troy, Hudson) were identified in New York and one PEJ area (Pittsfield) was identified in Massachusetts. The PEJ area in Massachusetts is outside the 20-mile COC radius yet was included to conservatively address nearby out-of-state PEJ area impacts. As noted above in the analysis, no predicted Project-related adverse impacts were noted. Furthermore, the analysis demonstrates that there are also no disproportionate impacts resulting from the proposed Project as the modeled impacts are higher within the non-PEJ areas when compared with PEJ areas within the COC. As a result of the modeling analysis, no adverse or disproportionate PEJ area impacts are predicted, therefore, the Project will follow standard public participation and permitting procedures.

## **ATTACHMENT 1**

United States Forrest Service Applicability Determination for  
Federal Land Manager Review of Air Quality Related Values Relating to the  
Ravena Plant Modernization Project



United States  
Department of  
Agriculture

Forest  
Service

Green Mountain & Finger Lakes  
National Forests  
Supervisor's Office

231 North Main St.  
Rutland, Vermont 05701  
Tel. (802) 747-6700  
FAX (802) 747-6766

[www.fs.fed.us/r9/gmfl](http://www.fs.fed.us/r9/gmfl)

File Code: 2580-3  
Date: December 23, 2008

Steven Riva  
Chief  
Permitting Section, APB  
U.S. Environmental Protection Agency  
290 Broadway, 25th Floor  
New York, NY 10007

Dear Mr. Riva,

Mr. Mills, of HDR One Company, has asked for Federal Land Manager (FLM) Review of Applicability in regards to the Lafarge Cement Facility Modernization Project in Ravena, NY. According to Mr. Mills' proposal, Carbon Monoxide (CO) is the only pollutant which is proposed to reach a level requiring PSD review. As the FLM role under the Clean Air Act is to address Air Quality Related Values (AQRV), and CO does not have any known affect on any AQRV for the Class I Wilderness Areas in the Green Mountain National Forest (Lye Brook Wilderness Area) or the White Mountain National Forest (Great Gulf Wilderness Area and Presidential Range-Dry River Wilderness Areas), the US Forest Service does not require further analysis.

Sincerely,

RALPH PERRON  
Air Quality Specialist

cc: Sarah Evans, Bill Voshell, Luis Cuellar, Scott Mills, Meg Mitchell, Tom Wagner, Alex Sienkiewicz, Katherine Stuart, Terry Miller, Thomas R Doane, Trent R Wickman



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