Ambient Air Quality Impact Report (AAQIR)
Ash Grove Cement Company
Moapa Paiute Plant
(NVC 05-01)

This document serves as the statement of basis required by 40 CFR Part 124. This document sets forth the legal and factual basis for permit conditions, including references to applicable statutory or regulatory provisions, including regulations under 40 CFR 52.21. This document is for all parties interested in the permit.

1.0 APPLICANT

Ash Grove Cement Company
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2.0 PROJECT LOCATION

Ash Grove Cement Company ("AGCC" or "applicant") is proposing to construct a quarry and Portland cement manufacturing plant on the Moapa Paiute Reservation in Clark County, Nevada. The proposed site is approximately 50 kilometers northeast of Las Vegas, Nevada. This location is designated as attainment/unclassified for the National Ambient Air Quality Standards (NAAQS) for nitrogen dioxide (a component of oxides of nitrogen ("NOx"), sulfur dioxide ("SOx"), ozone, carbon monoxide ("CO"), particulate matter and lead ("Pb"). The U.S. Environmental Protection Agency, Region IX, has jurisdiction for implementing the Clean Air Act's Prevention of Significant Deterioration ("PSD") program (40 U.S.C. §§ 7470-7479) on the Moapa Paiute Reservation to regulate the construction of new facilities that will emit attainment/unclassified pollutants. AGCC submitted an application to Region IX in October 2005 supporting issuance of a PSD permit allowing construction of the quarry and cement manufacturing plant. EPA determined that AGCC's application for a PSD Permit for construction of the Moapa Paiute Facility was administratively complete on March 2, 2006.

3.0 FACILITY DESCRIPTION

This document will refer to the quarry and cement manufacturing plant collectively as the "Moapa Paiute Facility" or "Facility", to the cement manufacturing portion of the Facility as the "Plant" and to the quarry operations as the "Quarry".

3.1 Limestone Quarry Operations

AGCC will manufacture Portland cement by mixing three basic raw materials (limestone, iron ore, and aluminum) in proper proportions to achieve the ultimate product. Limestone provides calcium, which is the major component of Portland cement. AGCC will obtain its limestone primarily from the Quarry and will transport the limestone to the Plant by a covered conveyor

belt.

At the Quarry, AGCC will use a mixture of Ammonium Nitrate and fuel oil as the blasting agent. After blasting, AGCC will load the limestone rubble on quarry trucks using front-end loaders. The quarry trucks will transport the limestone rubble to a primary crusher located in the Quarry. From the primary crusher, crushed and screened limestone material will be transported to the limestone storage dome using the covered conveyor. The limestone will be transported by a covered conveyor belt from the dome to the raw material storage building.

3.2 Cement Manufacturing Plant

AGCC's Portland cement manufacturing Plant will consist of four distinct operations:

- Raw material receiving, milling, blending and storage,
- Coal/coke and other fuel preparation and storage,
- Pyroprocessing, clinker production and storage, and
- Finish milling, cement storage, and load-out to shipping vehicles and railroad.

The Plant's four operations are summarized below.

3.2.1 Raw Material Receiving, Milling, Blending and Storage

The raw materials that AGCC will receive at the Facility are limestone, an iron source, an aluminum source, coal, and gypsum. AGCC will obtain most of the limestone from the Quarry by a covered conveyor from the limestone storage dome. The other raw materials (iron ore, pure aluminum source, coal, gypsum or alternative imported limestone) will be delivered to the Plant by truck or railcar.

AGCC will divide the raw materials into the proper amounts necessary for correct feed to the kiln. The proportioned raw materials will be dried using the exhaust from the top of the preheater, pulverized and size-classified in the raw mill circuit. AGCC will deliver the resulting ground raw material, called "raw meal", to a blend silo. From the blend silo, AGCC will send the raw meal to the six stage preheater tower by an enclosed pneumatic conveyor.

All of the emissions from AGCC's raw mill circuit will be vented through the Kiln Baghouse before being emitted to the atmosphere from the Main Stack. The Kiln Baghouse will eliminate most of the particulate matter emissions before the emissions are released to the atmosphere.

3.2.2 Coal Preparation and Pulverized Coal Storage

AGCC's coal will be delivered to the Facility by rail and placed initially in the raw material storage building. From the raw material storage building the coal will be sent by a covered conveyor to the coal storage silo. From the coal storage silo, AGCC will transport the coal by a covered conveyor belt to a mill where the coal will be pulverized. The coal mill will use hot gases from the kiln for

drying the pulverized coal. However, the kiln gases will be vented to a cyclone first to remove the raw meal dust so that it will not contaminate the pulverized coal.

The pulverized coal is the primary fuel for AGCC's kiln, which will use an indirect firing system. AGCC will transport the pulverized coal exiting the mill and collected from the coal mill baghouse by a covered conveyor belt first to a pulverized coal silo and then to the precalciner and the kiln burner. About 50 to 55 percent of the pulverized coal will be routed to the precalciner, and the remaining 45 to 50 percent of the pulverized coal will go to the rotary kiln. In addition to coal, AGCC will be allowed to burn natural gas, petroleum coke, non-hazardous used oil and tires as fuel at the Facility. All emissions calculations in the application reflect the worst case fuel use scenario.

3.2.3 Pyroprocessing, Clinker Production and Storage

AGCC will form the Portland cement clinker by delivering the blended raw meal by a fully enclosed pneumatic conveyor into the six stage preheater and then to the precalciner. (The customary terminology in the Portland cement industry is that a calciner preceding a kiln is referred to as a "precalciner.") The collective system consisting of the in-line kiln, the precalciner, the preheater, the raw mill circuit and the coal mill is referred to as the "pyroprocessing system". The emissions from the pyroprocessing system are ducted through a baghouse into single stack and to the atmosphere.

The six stage preheater begins the process of dehydrating the raw meal after it has been ground by the raw mill. The precalciner follows and eliminates up to 95 percent of the carbon dioxide from the calcium carbonate in the limestone. Hot gases exiting the rotary kiln rise through the six stages of the preheater. Pulverized coal fuel is introduced in a staged fashion to the precalciner in up to two locations. Thermal processing in the precalciner initiates the calcining reactions, and intimately mixes the materials prior to introducing them into the rotary kiln. The precalciner consumes about 50 to 55 percent of the total coal fuel fed to the entire pyroprocessing system. Tertiary combustion air is introduced to the precalciner after being pre-heated in the clinker cooler and hood. Combustion gases carrying hot, calcined solids exit the precalciner and are cleaned with a cyclone. The discharged solids from the bottom of this cyclone are introduced by gravity to the upper end of the rotary kiln. The cleaned hot gases exiting the top cyclone are split to the raw mill and to the coal mill.

Calcined solids collected from the precalciner and the cyclone are then introduced to the rotating cylindrical kiln. It is this kiln, lined with refractory material, in which the chemical and physical processes leading to formation of "clinker" reactions are completed. The rotation of the kiln promotes mixing and better conversion of the solid material, and improves heat transfer from the gases to the solids. Combustion air for the kiln is preheated as it is drawn in through several sections of the reciprocating-grate clinker cooler. The combustion gases pass counter-currently to the process which heats the calcined solids in the kiln, raising the temperature of the solids to 2600 °F or higher and creating a strong oxidizing environment. Under these conditions, the finely pulverized raw materials undergo a complex set of chemical reactions, and the semi-molten mass fuses into small grayish-black lumps called clinker.

The hot clinker falls from the lower end of the kiln onto the moving grate of the clinker cooler where it is cooled by incoming air. The cooled clinker then passes through a roller crusher prior to final grinding and storage.

Air from the fans in the clinker cooler contacts the hottest clinker and is then sent to the kiln hood as secondary and tertiary combustion air. The secondary combustion air goes through the lower end of the kiln towards the kiln burner. The tertiary combustion air goes via a kiln bypass duct as combustion air for the precalciner.

3.2.4 Final Milling, Storage and Load-out

The cooled clinker discharged from the clinker cooler is conveyed to an enclosed storage structure. This clinker, as well as gypsum and limestone, are transferred in appropriate proportions to a covered conveyor belt feeding the finishing mill system. AGCC then transports the Portland cement product with a closed pneumatic conveyor to a cement silo for final storage before being loaded into trucks and rail cars.

4.0 EMISSIONS FROM THE PROPOSED PROJECT

The proposed Moapa Paiute Facility's estimated maximum annual emissions, from both the Quarry and the Plant, are summarized in Table 1 and are based on vendors' data, AGCC's design criteria, EPA emission factors from AP-42, and established emission calculation procedures. The estimated emissions include emissions from the pyroprocessing system, the Facility dust collectors (baghouses), paved and unpaved roads, and materials handling operations. The estimated emissions assume full time operation of 8760 hours per year.

Table 1
Facility Estimated Emissions (tons per year)

Process	NOx (tpy)	VOC (tpy)	PM10 (tpy)	CO (tpy)	SO2 (tpy)	Pb
In line kiln/raw mill/coal mill	1708	88	82	920	368	0.07
Facility dust collectors			185			
Finish mill (VOC)		9.6				
Storage tanks		<0.1				
Emergency generator	11	0.5	0.5	4.1	3.0	

Fugitive emissions			16			
Facility total	1719	98	283	924	371	0.07

Notes: 1. PM10 emissions from the finish mill are included with the Facility dust collectors. 2. The VOC emissions from the finish mill result from the use of a grinding aid.

5.0 APPLICABILITY OF THE PREVENTION OF SIGNIFICANT DETERIORATION (PSD) REGULATIONS

The PSD regulations (40 CFR 52.21) define a "major source" as any source type belonging to a list of 28 source categories which emits or has the "potential to emit" 100 tons per year (tpy) or more of any pollutant regulated under the Clean Air Act, or any other source type which emits or has the potential to emit such pollutants in amounts equal to or greater than 250 tpy. Because the proposed Moapa Paiute Facility includes a Portland cement plant, it is one of the 28 source categories specified in EPA guidance and the 100 tpy threshold applies. The PSD regulations also require AGCC to include fugitive emissions in the calculations if the source belongs to one of the 28 source categories.

Under the PSD regulations, a significant emissions increase is defined as an increase in emissions greater than the major source or significance threshold prescribed for any pollutant subject to the regulation. The major source threshold is 100 tpy and the significance thresholds prescribed by the PSD regulations, together with the proposed Moapa Paiute Facility's estimated emissions, are listed in Table 2.

Table 2
Comparison of the Project Annual Emissions to the PSD Thresholds

Pollutant	PSD Significance Level (tpy)	Project Emissions (tpy)
CO	100	924
NOx	40	1719
SO_2	40	371
PM10	15	283
Ozone (VOC)	40	98
Pb	0.6	0.07

PSD review, therefore, applies to all of the listed pollutants except for Lead (Pb). As noted above, the proposed Moapa Paiute Facility will be located on the Reservation in an area within

the Las Vegas Intrastate Air Quality Control Region, which currently has a designation of attainment for all pollutants.

AGCC's proposed Moapa Paiute Facility is a major source subject to PSD requirements because its estimated emissions exceed 100 tpy for NOx, CO, SO_2, and PM10. See Table 2. The proposed Facility is also subject to PSD requirements for VOC emissions because its estimated VOC emissions exceed the significance threshold. The proposed Facility is not subject to PSD requirement for Lead because its estimated emissions are less than the significance threshold. The pollutants that are subject to PSD review must satisfy the following requirements:

- Application of Best Available Control Technology (BACT);
- Analysis of ambient air quality impacts from the project on the NAAQS and PSD increments;
- Analysis of air quality and visibility impacts on Class I areas; and
- Analysis of impacts on soils and vegetation.

6.0 BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

The federal Clean Air Act (CAA) defines BACT as an emission limitation based on the maximum degree of reduction of each pollutant emitted from or which results from any major emitting facility. The permitting authority determines BACT on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs. The BACT determination may take into account application of processes and available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of each such pollutant. The BACT rate may not result in emissions of any pollutant which will exceed the emissions that would be allowed by any applicable standard established pursuant to section 111 or 112 of the Clean Air Act.

For attainment pollutants being regulated in a PSD permit, EPA evaluates control requirements through a "top-down" BACT determination, which is described in EPA's New Source Review Workshop Manual, Draft October 1990, page B-6. The top-down approach to the BACT review involves determining the most stringent control technique available (also know as Lowest Achievable Emission Rate or LAER) for that class or category of emission source. If it can be shown that LAER is technically, environmentally, or economically infeasible, on a case-by-case basis for the particular source under evaluation, then the next most stringent level of control is identified and evaluated. The process continues until a control technology and associated emission level is determined which cannot be eliminated by any technical, environmental, or economic objections. The five steps in a top-down BACT evaluation are:

Step 1. Identify all available control options with practical potential for application to the specific emission unit for the regulated pollutant under evaluation;

Step 2. Eliminate technically infeasible technology options;

Step 3. Rank remaining control technologies by control effectiveness;

Step 4. Evaluate the most effective control alternative and document the results; if the top option is not selected as BACT, evaluate the next most effective control option; and

Step 5. Select BACT, which will be the most effective control option that is not rejected based on energy, environmental, and economic impacts.

AGCC performed a BACT analysis, as required, for NOx, CO, PM_{10}, SO_2, and VOC The BACT analysis is documented in AGCC's PSD permit application. EPA independently evaluated AGCC's BACT analyses separately for the different emissions units described above in Section 3 (Project Description) and for each pollutant. The proposed BACT requirements appear in Table 3.

Table 3. Moapa Paiute Facility Proposed BACT limits.

	NOx	SO2	CO	PM10	VOC	Opacity
pyroprocessing system (main stack)	1.95 lb/ton clinker	0.42 lb/ton clinker	1.05 lb/ton clinker	0.070 lb/ton clinker	0.0625 lb/ton clinker	10%
	430.6 lb/hr	92.8 lb/hr	231.9 lb/hr	15.5 lb/hr	13.8 lb/hr	
clinker cooler				0.025 lb/ton		10%
				5.5 lb/hr		
miscellaneous baghouses				0.01 gr/dscf		5%

6.1 Pyroprocessing System (In-Line Kiln/Precalciner/Preheater/Raw Mill and Coal Mill):

6.1.1 NOx Control Technologies

NOx is formed during the combustion of fossil fuels including coal and is generally classified as either thermal NOx or fuel NOx. Thermal NOx is formed when elemental nitrogen reacts with oxygen in the combustion air within the high temperature environment of the rotary kiln. The rate of formation of thermal NOx is a function of residence time and free oxygen, and is exponential with peak flame temperature. Fuel NOx is generated when nitrogen contained in the coal itself is oxidized. The rate of formation of fuel NOx is primarily a function of fuel bound nitrogen content of the coal but is also affected by fuel air mixing.

Summary of top-down BACT analysis:

Step 1: Identify all control technologies to reduce NOx from the pyroprocessing system:

Kiln Type and Good Operating Practice (GOP)

Low NOx Burner in Rotary Kiln (LNB)
Fuel Substitution
Flue Gas Recirculation (FGR)
Cement Kiln Dust (CKD) Insufflation
Multistage Combustion (MSC)
Mixing Air Fan
Selective Non-catalytic Reduction (SNCR)
Selective Catalytic Reduction (SCR)

Step 2: Eliminate technically infeasible technology options:

EPA concurs with AGCC's determination that fuel substitution, FGR, CKD insufflation, and using a mixing air fan are technically infeasible control options for controlling NOx from the proposed Facility's pyroprocessing systems. FGR is used at utility boilers, but would result in an unacceptable cement product quality and has not been applied at a cement kiln. The Moapa Paiute Facility will not generate any CKD and thus is not an option. The use of a mixing air fan for NOx control at a rotary kiln has been surpassed by the low NOx calciner included with the Moapa Paiute Facility. These reasons are discussed more fully in the application.

EPA does not agree with AGCC's determination that application of SCR is technically infeasible. At least two facilities operating in Europe (Solnhofer, Germany and Monselice, Italy) are successfully implementing SCR technology on the pyroprocessing system at Portland cement manufacturing facilities. SCR is not, therefore, technically infeasible. EPA discusses SCR further in Step 5 below.

Step 3: Rank remaining control technologies by control effectiveness:

The proposed Facility's pyroprocessing system can use a combination of the technically feasible NOx control technologies. The combinations are listed below with an achievable emission rate from the most to least stringent level of control:

		NOx Emission Rate (lb/ton clinker)
1.	GOP, LNB, MSC and SNCR	1.95-2.4
2.	GOP, LNB, MSC and SCR	> 2.0 (based on Solnhofer and Monselice)
3.	GOP, LNB, MSC	2.8
4.	MSC	2.9
5.	LNB	3.5
6.	GOP	4.0

EPA also considered the information available in EPA's RACT/BACT/LAER Clearinghouse and databases maintain by the California Air Resources Board and the South Coast Air Quality Management District showing the most stringent NOx emission rates established in recent PSD Permits.

Step 4. Evaluate the most effective control alternative or combination and document the results.

If the top option is not selected as BACT, then AGCC must evaluate the next most effective control option.

Table 4. Recent Cement PSD Permit NOx Limits [lb/ton clinker].

	NOx limit	Averaging time	control	Date	Permit id
Suwanee American (FL)	1.95	30-day rolling	SNCR	2/20/06	PSD-FL-352
Drake (AZ)	1.95	30-day rolling	SNCR	4/12/06	101770

The most stringent emission rate that can be achieved to reduce NOx emissions from the proposed pyroprocessing system is GOP, LNB, MSC and SNCR, achieving a NOx emissions rate of 1.95 lb NOx/ton of clinker.

Step 5. Select BACT, which will be the most effective technically feasible option not rejected based on energy, environmental, and economic impacts.

The proposed PSD permit requires AGCC to install and operate the most stringent combination of controls identified in Step 4, which is a combination of GOP, LNB, MSC and SNCR and an emission limit of 1.95 lb NOx/ton clinker. EPA did not select the combination of controls that relied on installation of SCR because the emission limit that has been demonstrated at the facility in Germany is slightly higher than 1.95 lb NOx/ton clinker. EPA believes that a lower emission rate will be demonstrated with SCR in the near future.

The selected BACT technologies are briefly described below.

6.1.1.1 Selective Non-Catalytic Reduction (SNCR)

Ammonia (NH3) will react with NOx and Oxygen to form Nitrogen and water. This reaction takes place in the temperature range between 1600 and 1995ºF without the presence of a catalyst and is called selective non-catalytic reduction (SNCR). This temperature range is present in the pre-calciner section of the pyroprocessing system. The NH3 will be injected through ports in the pre-calciner and will convert the NOx to Nitrogen, which is then emitted to the atmosphere.

6.1.1.2 Multi Stage Combustion (MSC)

Multi Stage Combustion requires that some fuel be combusted outside of the burning zone in the kiln. The kiln at the Facility will combust fuel in the kiln and the precalciner. This reduces the peak flame temperature thereby reducing the amount of thermal NOx the proposed Facility will generate. This is also a low oxygen atmosphere which also limits the amount of NOx formed.

6.1.1.3 Low NOx Burner (LNB)

Low NOx burners reduce the amount of thermal NOx produced by controlling the air to fuel ratios fired in the burners.

6.1.1.4 Good Operating Practice (GOP)

Good operating practice (GOP) consists of several independant kiln operating practices which reduce the generation of NOx. These include advanced process analyzers and controls used to minimize fuel consumption and minimize excess combustion air.

6.1.2 SO2 Control Technologies

Sulfur is present in the fuel combusted at the cement kiln and the raw materials used to manufacture the Portland cement at the proposed Facility. Each of these sources of sulfur could result in SO2 emissions to the atmosphere. However, the sulfur present in the fuel is oxidized to SO2 and is almost completely scrubbed out of the exhaust gas before it can be released into the atmosphere through contact with the lime/limestone in the kiln and precalciner. Sulfur dioxide can also be generated from the oxidation of sulfur compounds in the raw materials and the fuels. The SO2 emissions from the fuels and the kiln feed are controlled by reactions with other compounds present in the kiln system, particularly limestone (CaCO3) and lime (CaO). In general, SO2 will react with CaO or CaCO3 to form calcium sulfite (CaSO3) or calcium sulfate (CaSO4). The calcium sulfate and sulfite are solids and are incorporated into the clinker product and/or captured by the baghouse. AGCC performed and EPA evaluated a BACT analysis for the SO2 originating in the fuel and in the raw materials (primarily the limestone).

Step 1: Identify All Control Technologies

Fuel Inherent Dry Scrubbing (Fuel IDS)
Fuel Substitution
Raw Material Substitution
Mixing Air Fan
In-Line Raw Mill
Dry Lime Scrubbing (DLS)
Lime Spray Dryer (LSD)
Wet Lime Scrubbing (WLS)

Step 2: Eliminate technically infeasible technology options

Fuel substitution and a mixing air fan are technically infeasible SO2 control options at the proposed Plant. The use of a LSD would be redundant to (i.e., provide the same level of control as) DLS (D-SOx type) and does not require further consideration.

Step 3: Rank remaining control technologies by control effectiveness

The technically feasible control technologies and the achievable emission rate are listed in order from most to least stringent level of control:

	SO2 Emission Rate (lb/ton clinker)
<u>Fuel SO2</u>	
1. Fuel IDS	0.0

Kiln Feed SO2

1. WLS, In-Line Raw Mill, IDS 0.01-0.05
2. In-Line Raw Mill, DLS, IDS 0.01-0.42
3. In-Line Raw Mill, IDS 0.01-0.42
4. DLS, IDS 0.01-0.42
5. IDS 0.01-2.32

EPA also evaluated recent SO2 emission limits in PSD permits for other facilities as listed below in Table 5.

Table 5. SO2 limits at Recent PSD Cement Permits [lb/ton clinker].

	SO2 limit	Averaging time	Control Technology
Suwanee (FL)	0.20	24-hour rolling	IDS
Lehigh – Mason City	1.01	30-day rolling	WLS
TXI – Midlothian	1.33		WLS
CEMEX – Davenport	2.66	24-hour rolling	Spray Dry Absorber
Drake – AZ	0.066	annual	IDS
Titan Medley (FL)	0.50		IDS

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

AGCC's application estimates that installing and operating WLS would cost approximately $17,000 per ton of SO2 removed and that WLS would consume a significant amount of water resulting in an unacceptable environmental impact in the arid environment where the proposed Facility will be constructed. EPA has evaluated the information that AGCC submitted in the application and concurs with AGCC's estimated costs and environmental impacts for WLS. EPA also concurs that WLS can be eliminated from the potential control technologies because it is not cost-effective and results in unacceptable environmental impacts.

Step 5. Select BACT, which will be the most effective option not rejected based on energy, environmental, and economic impacts.

The proposed PSD permit requires AGCC to reduce SO2 emissions from the pyroprocessing system by using an In-Line Raw Mill, DLS, and IDS, which will limit the emissions to 0.42 lb SO2/ton clinker. The SO2 emission limit of 0.42 lb SO2/ton clinker is one of the lowest limits established by recent permits.

A brief description of the technologies is provided below.

6.1.2.1 Inherent Dry Scrubbing

The presence of lime in the pre-calciner and the kiln at high temperatures ensures that nearly all

of the SO2 produced from fuel combustion is converted to CaSO3 or CaSO4. The kiln and pre-calciner function as effective scrubbing vessels and remove nearly all of the SO2 resulting from the sulfur in the fuels combusted in the kiln and pre-calciner.

6.1.2.2 In-Line Raw Mill

The emissions from the top of the pre-heater will be routed through the raw mill in order to dry the raw materials before they are fed into the kiln. This configuration also ensures that the exhaust gas comes into contact with moist, ground limestone. This period of contact removes additional SO2 from the stack gas. The in-line raw mill will be taken out of service for 5% of the time in order to perform routine maintenance.

6.1.2.3 Dry Lime Scrubbing

During the time that the in-line raw mill is out of service, the emissions will be controlled with a D-SOx™ type dry lime scrubber. This process removes hot calcined material from the pre-calciner and sends it to the top of the pre-heater tower where it scrubs some of the SO2 produced by the sulfur in the feed.

6.1.3 PM10 Control Technologies

PM10 is emitted through the main stack at the proposed AGCC Facility. AGCC performed and EPA evaluated a BACT analysis for PM10 from the pyroprocessing system at the Plant.

Step 1: Identify All Control Technologies

Fabric Filter
Electrostatic Precipitator (ESP)
Wet Scrubber
Cyclone

Step 2: Eliminate technically infeasible technology options

An ESP is technically infeasible at a coal mill due to the explosion hazard represented by the combination of coal dust and sparks. Wet scrubbers are also technically infeasible at a cement kiln because the water will combine with cement and produce concrete deposits. Therefore, we concur with eliminating the ESP and wet scrubbers from the technically feasible control options for SO2 emissions from the pyroprocessing system.

Step 3: Rank remaining control technologies by control effectiveness

These technically feasible control options and the achievable emission rates are listed in order from most to least stringent level of control:

PM10 Emission Rate (% control efficiency)

1. Fabric Filter 99-99.99
2. Cyclone 90

EPA has also reviewed the RACT/BACT/LAER Clearinghouse database to review the PM10 emissions limits in other recent PSD permits for cement plants.

Table 7. PM10 limits at Recent PSD Cement Permits [lb PM10/ton clinker].

	lb PM10	Test Methods	control
Suwanee American	0.17 (kiln+cooler)	RM 5	fabric filter
Drake	0.0716	RM5+202	fabric filter

Step 4. Evaluate most effective control alternative and document results; if the top option is not selected as BACT, evaluate next most effective control option.

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

The PM10 emissions from the pyroprocessing system at AGCC's proposed Facility will be controlled through the most stringent and technically feasible level of controls identified in Step 4, a fabric filter. EPA is proposing to establish an emission rate of 0.07 lb PM10/ton Clinker which is the lowest emission limit for PM10 emissions from a cement kiln in any PSD permit.

6.1.4 CO Control Technologies

CO is a product of the incomplete combustion of fuel. AGCC performed and EPA evaluated a BACT analysis for CO emissions from the pyroprocessing system.

Step 1: Identify All Control Technologies

Good Combustion Practice
Mixing Air Fan
Thermal Oxidation
Catalytic Oxidation

Step 2: Eliminate technically infeasible technology options

A mixing air fan and catalytic oxidation are technically infeasible PM10 control options at cement kilns. Mixing air fans are used at cement kilns with mid-kiln firing. The kiln at the proposed Facility will not use mid-kiln firing. Catalytic oxidation is also not technically feasible in the kiln due to the high possibility of poisoning and/or fouling the catalyst.

Step 3: Rank remaining control technologies by control effectiveness.

The remaining technologies are listed in order from most to least stringent level of control:

	CO Control Efficiency
1. Thermal Oxidizer	83%
2. Good Combustion Practice	base case

Table 7. CO limits at Recent PSD Cement Permits [lb/ton clinker].

	CO limit	Averaging time	control	Date	Permit id
Suwanee American	2.9	30-day rolling	GCP	2/20/06	PSD-FL-352
Drake	3.6	3-hr rolling	GCP	3/12/06	1001770

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

AGCC estimated that the cost of installing and operating a thermal oxidizer, specifically a regenerative thermal oxidizer (RTO), would exceed $10,000 per ton of CO removed and would consume a significant amount of natural gas to heat the exhaust gas resulting in an additional adverse environmental impact. EPA evaluated the information submitted by AGCC to support the estimated costs and energy impacts, and concurs in AGCC's elimination of the thermal oxidizer based on cost effectiveness and energy impacts.

Step 5. Select BACT, which will be the most effective option not rejected based on energy, environmental, and economic impacts.

The CO emissions from the pyroprocessing system at the proposed Facility will be controlled through the most stringent and technically feasible level of control identified in Step 4 which was not eliminated based on cost and energy impacts. The proposed PSD permit requires AGCC to comply with good combustion practices and demonstrate compliance with an emission limit of 1.05 lb CO/ton clinker. The proposed PSD permit emission limit is much lower than the limit established for CO in other recent permits for cement kilns.

6.1.4.1 Good Combustion Practice

Good combustion practice (GCP) ensures that at each combustion site there is sufficient oxygen, and adequate time, temperature and turbulence to completely oxidize all carbon compounds to CO2.

6.1.5 VOC Control Technologies

The majority of VOC's emitted from a cement kiln are produced from the volatilization of hydrocarbon constituents, petroleum or kerogens, present in the raw materials. These hydrocarbons are evaporated in the top of the preheater tower and emitted through the stack as total hydrocarbons, a subset of volatile organic compounds (VOC's). Incomplete combustion may also produce VOC's in the form of products of incomplete combustion. AGCC performed and EPA evaluated BACT technologies for VOC emissions from the pyroprocessing system.

Step 1: Identify All Control Technologies

Good Combustion Practice
Raw Material Substitution
Thermal Oxidation
Catalytic Oxidation

Step 2: Eliminate technically infeasible technology options

Catalytic oxidation is a technically infeasible VOC control option at cement kilns due to the high possibility of poisoning and/or fouling the catalyst.

Step 3: Rank remaining control technologies by control effectiveness.

The remaining technologies are listed in order from most to least stringent level of control:

	VOC Control Efficiency
1. Thermal Oxidizer	95%
2. Raw Material Substitution	site and material specific
3. GCP	base case

Table 6. VOC limits at Suwanee American Cement Permit [lb/ton clinker].

	VOC limit	Averaging time	Control	Date	Permit id
Suwanee American	0.12	30-day block	GCP	2/20/06	PSD-FL-352
Drake	0.12	annual	GCP	3/12/06	1001770

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

AGCC estimated that the cost of installing and operating a thermal oxidizer, specifically a regenerative thermal oxidizer (RTO), would be greater than $100,000 per ton of VOC removed and that the oxidizer would consume a significant amount of natural gas to heat the exhaust gas. EPA evaluated AGCC's analysis and concurs in eliminating the oxidizer as a control option based on cost effectiveness and other environmental impacts. AGCC also evaluated raw material substitution which would require replacing the limestone that will be quarried at Moapa Paiute with limestone imported from off site. AGCC estimated that the transportation cost be prohibitive and defeat the purpose of siting a cement plant at the Moapa Paiute location. EPA evaluated AGCC's analysis and concurs that raw material substitution may be eliminated based on cost, energy and other environmental impacts due to transportation.

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

The VOC emissions from the pyroprocessing system at the Ash Grove Moapa Paiute project will be controlled through the most stringent and technically feasible level of controls identified in

Step 4, good combustion practice.

The proposed PSD permit establishes a BACT emission limit for the Moapa Paiute Facility of 0.0625 lb VOC per ton of clinker as determined by a 30-day block average. This VOC BACT limit is significantly lower than the limits established for other recently permitted cement plants.

6.1.5.1 Good Combustion Practice

Good combustion practice ensures that at each combustion site there is sufficient oxygen, and adequate time temperature and turbulence to completely oxidize all carbon compounds to CO2.

6.2 Clinker Cooler BACT Evaluation

6.2.1 PM10 Control Technologies

AGCC performed a BACT analysis for PM10 emissions from the clinker cooler at the Plant.

Step 1: Identify All Control Technologies

Fabric Filter
Electrostatic Precipitator (ESP)
Wet Scrubber
Cyclones

Step 2: Eliminate technically infeasible technology options

Wet scrubbers are technically infeasible at a cement kiln because the water will combine with cement and produce concrete deposits.

Step 3: Rank remaining control technologies by control effectiveness

The remaining technologies are listed in order from most to least stringent level of control:

	PM10 Emission Rate (% control efficiency)
1. Fabric Filter	99-99.99
2. ESP	99-99.9
3. Cyclone	90

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option.

A fabric filter resulting in 99% control efficiency is the most effective control and it has not been eliminated based on cost, energy or other environmental impacts.

Step 5. Select BACT, which will be the most effective practical option not rejected based on

energy, environmental, and economic impacts.

AGCC will install and operate a fabric filter to reduce PM10 emissions from the clinker cooler at the Moapa Paiute Facility. It is the most stringent and technically feasible level of control identified in Step 4, and the proposed PSD permit establishes a BACT PM10 emissions limit of 0.025 lb PM/ton clinker, which is within the range of the lowest PM10 BACT emissions limits for recently permitted.

Table 6. PM10 limits for Clinker Coolers at Recent PSD Cement Permits [lb/ton clinker].

	PM10 limit	Test Method	Control
Suwannee	0.17 [kiln + cooler]	RM 5	Fabric Filter
Drake	0.027	RM 5	Fabric Filter

6.3 Haul Road PM10 BACT Evaluation

Truck traffic on unpaved haul roads, those within the quarry area, at a cement plant is a significant source of fugitive PM10 emissions. The BACT analysis was performed for PM10 from the haul roads at the Quarry.

Step 1: Identify All Control Technologies

Dust Suppressing Chemical Spray
Water Spray
Sweeping
Paving
Silt Content Reduction

Step 2: Eliminate technically infeasible technology options

Paving of the haul roads within the Quarry area is technically infeasible because the ultra heavy mining trucks would destroy the paved surface and the changing location of the quarried areas would require that new paved roads be constructed continuously.

Step 3: Rank remaining control technologies by control effectiveness

These are listed in order from most to least stringent level of control:

	PM10 Emission Rate (cumulative % control efficiency)
1. Water/Chemical Dust Suppressant	97
2. Silt Content Reduction	37

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

Step 5. Select BACT, which will be the most effective practical option not rejected based on

energy, environmental, and economic impacts.

The PM10 emissions from the unpaved haul roads at the Moapa Paiute project will be controlled through the most stringent and technically feasible level of controls identified in Step 4, a combination of reducing the silt content through the application of crushed stone to the road surface and periodic application of water and/or chemical dust suppressants.

6.4 Plant Road PM10 BACT Evaluation

Truck traffic on the roads within the plant area at a cement plant is a significant source of fugitive PM10 emissions. AGCC performed a BACT analysis for PM10 from the Plant roads at the Facility.

Step 1: Identify All Control Technologies

Dust Suppressing Chemical Spray
Water Spray
Sweeping
Paving
Silt Content Reduction

Step 2: Eliminate technically infeasible technology options

All of the control technologies identified above are technically feasible at a cement plant.

Step 3: Rank remaining control technologies by control effectiveness

The technologies are listed in order from most to least stringent level of control:

	PM10 Emission Rate (cumulative % control efficiency)
1. Paving and Water Spray	97
2. Water Spray	90
3. Chemical Dust Suppressing Spray	90
4. Paving	70
5. Sweeping	37
6. Silt Content Reduction	37

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option and document results.

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

The proposed PSD permit will require AGCC to reduce PM10 emissions from the unpaved Plant roads at the Moapa Paiute Facility based on the most stringent level of control identified in Step

4, a combination of paving the Plant roads and periodic application of water and sweeping the paved roads. The PM10 emissions from the Plant and Quarry roads will be controlled through best management practices for minimizing fugitive dust and will not have an associated emission limit.
[CAN WE SAY THAT THIS IS A WORKPRACTICE REQUIREMENT SO ASSOCIATED EMISSION LIMIT]

6.5 Storage Pile at the Quarry Area PM10 BACT Evaluation

AGCC will maintain storage piles at the Quarry which are small, mobile and temporary and will result in PM10 emissions. AGCC performed and EPA evaluated a BACT analysis for PM10 from the storage piles at the Quarry area of the Facility.

Step 1: Identify All Control Technologies

Chemical Dust Suppressing Spray
Water Spray
Enclosure
Fabric Filter

Step 2: Eliminate technically infeasible technology options

None of the PM10 control technologies identified in step is technologically feasible for the small storage piles that change location within the Quarry area. The discussion of technical feasibility is contained in the application.

Step 3: Rank remaining control technologies by control effectiveness

NONE

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

No control technologies are available to reduce the PM10 emissions from the Quarry storage piles at the Moapa Paiute site.

6.6 Storage Piles at the Plant Area PM10 BACT Evaluation

The BACT analysis was performed for PM10 from the storage piles at the Plant area of the Facility.

Step 1: Identify All Control Technologies

Chemical Dust Suppressing Spray
Water Spray
Enclosure
Fabric Filter

Step 2: Eliminate technically infeasible technology options

Each of the PM10 control technologies identified in step is technologically feasible for the storage piles within the Plant area.

Step 3: Rank remaining control technologies by control effectiveness

These are listed in order from most to least stringent level of control:

	PM10 Emission Rate (cumulative % control efficiency)
1. Fabric Filter	95-99.99
2. Chemical Dust Suppressing Spray	90
3. Water Spray	90
4. Enclosures	75-95

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

BACT for control of PM10 from the storage piles within the Plant area is an enclosure vented to a fabric filter. Specifically, the limestone at the Moapa Paiute Facility will be stored in a dome that is vented to a fabric filter. Other raw materials and solid fuels will be stored in an enclosed storage building also vented to a fabric filter.

6.7 Material Processing and Transfer PM10 BACT Evaluation

Materials are moved throughout the Portland cement manufacturing process, often by conveyors. These materials are transferred from these material handling and storage points to other material handling activities. These transfer points are sources of PM10 emissions. Some transfer points and storage areas are enclosed and the emissions are controlled with baghouses. Materials are also loaded and unloaded onto trucks in the Quarry and Plant areas.

Step 1: Identify All Control Technologies

High Material Moisture Content
Wet Scrubbing Systems
ESP

Cyclones
Enclosures
Fabric Filter System

Step 2: Eliminate technically infeasible technology options

Wet scrubbing and water sprays are not technologically feasible PM10 control technologies for the storage piles within the Plant area because materials at a cement plant must be kept dry.

Step 3: Rank remaining control technologies by control effectiveness

These are listed in order from most to least stringent level of control:

	PM10 Emission Rate (cumulative % control efficiency)
1. Fabric Filter	95-99.99
2. ESP	99-99.9
3. Enclosures	75-95
4. High Material Moisture Content	90
5. Cyclones	30-90

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

BACT for control of PM10 from the storage piles within the Plant area is an enclosure vented to a fabric filter.

6.8 Quarry Drilling

Track mounted drills are used to loosen the limestone and place the charge before blasting. The BACT analysis was performed for the emissions from these mobile drills.

Step 1: Identify All Control Technologies

High Material Moisture Content
Fabric Filter System

Step 2: Eliminate technically infeasible technology options

High material moisture content and a fabric filter system are technically feasible control systems for the mobile drills at a cement plant.

Step 3: Rank remaining control technologies by control effectiveness

These are listed in order from most to least stringent level of control:

	PM10 Emission Rate (% control efficiency)
1. Fabric Filter	95-99.99
2. High Material Moisture Content	90

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

The emissions of PM10 from the mobile drills within the Quarry area will be vented to a fabric filter.

6.9 Quarry Crushing

The limestone will be crushed in the Quarry before it is transported to the Plant area. The BACT Analysis was performed for the crushing operation in the Quarry area.

Step 1: Identify All Control Technologies

High Material Moisture Content
Fabric Filter System
Cyclones

Step 2: Eliminate technically infeasible technology options

High material moisture content, cyclones and a fabric filter system are technically feasible control systems for the crushing in the quarry at the cement plant.

Step 3: Rank remaining control technologies by control effectiveness

These are listed in order from most to least stringent level of control:

	PM10 Emission Rate (% control efficiency)
1. Fabric Filter	95-99.99
2. High Material Moisture Content	90
3. Cyclones	30-90

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

Step 5. Select BACT, which will be the most effective practical option not rejected based on

energy, environmental, and economic impacts.

The emissions of PM10 from the crushing within the Quarry area will be vented to a fabric filter.

6.10 Quarry Loading and Unloading Operations

Crushed and uncrushed material is loaded and unloaded in the Quarry. The BACT analysis was performed for these loading and unloading operations.

Step 1: Identify All Control Technologies

High Material Moisture Content

Step 2: Eliminate technically infeasible technology options

High material moisture content is technically feasible for the loading and unloading in the Quarry at the cement plant. .

Step 3: Rank remaining control technologies by control effectiveness

These are listed in order from most to least stringent level of control:

	PM10 Emission Rate (% control efficiency)
1. High Material Moisture Content	90

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

The emissions of PM10 from the loading and unloading within the Quarry area will be controlled through water application to maintain a high material moisture content.

6.11 Finish Mill (VOC)

The finish mill is used to grind clinker product into a fine powder. Small amounts of gypsum are added to the clinker to control the setting time of the concrete. A grinding aid is also added to the clinker in the finish mill. This grinding aid contains a VOC which is released to the atmosphere from the finish mill. The BACT analysis was performed for the control of VOC emissions from the finish mill.

Step 1: Identify All Control Technologies

NONE

Step 2: Eliminate technically infeasible technology options

Step 3: Rank remaining control technologies by control effectiveness

NONE

Step 4. Evaluate most effective control alternative and document results; if top option is not selected as BACT, evaluate next most effective control option

Step 5. Select BACT, which will be the most effective practical option not rejected based on energy, environmental, and economic impacts.

No technologies are available to the VOC emissions from the finish mill.

6.12 Emergency Generator

The applicant will maintain one 2,000 kilowatt (kW) diesel-powered emergency generator on site to provide power during an outage. The generator will be used to provide power to operate emergency equipment and to maintain rotation of the kiln. The kiln must be rotated slowly in an emergency shutdown to prevent warping or other damage during the cool down from the high operating temperature. Based on review of recent permits for similar emergency diesel engines and EPA's RACT/BACT/LAER Clearinghouse, the top level of control or lowest NOx emission rate is approximately 6.5 g/hp-hr. The applicant's proposed generator will be subject to the New Source Performance Standard for Stationary Compression Ignition Internal Combustion Engines at 40 CFR 60 Subpart IIII and will be subject to the following emissions and fuel sulfur limits:

6.12.1 NOx – reduce NOx by 90% or limit engine exhaust to 0.30 grams/hp-hr;
6.12.2 PM – reduce PM by 60% or limit engine exhaust to 0.09 grams/hr-hr;
6.12.3 diesel fuel – must contain less than 500 parts per million (ppm) sulfur by October1 , 2007 and 15 ppm sulfur by October 1, 2010.

The NOx, PM and fuel sulfur limits in NSPS IIII combined with the limit of 500 operating hours per year constitute BACT for the emergency generator.

7.0 AIR QUALITY IMPACTS

The PSD regulations require an air quality analysis to determine the impacts of the proposed Facility on ambient air quality. For all regulated pollutants emitted in significant quantities, the analysis must consider whether the proposed Facility will cause a violation of (1) the National Ambient Air Quality Standards (NAAQS), or (2) the applicable PSD increments. A discussion of the general approach, air quality model selection, significant impact levels, PSD increment consumption, and the proposed Facility's compliance with ambient air quality standards is presented below.

EPA's concluded that AGCC used appropriate modeling procedures and followed applicable guidance documents to show that the proposed Facility would not violate any NAAQS or PSD increment, and would not have an adverse impact on any Air Quality Related Value (AQRV) at any Class I area. The modeling demonstrates that proposed Facility is will not exceed the significance impact level (SIL) for SO2 and CO, but will exceed the SIL for NO2 and PM10. Therefore, AGCC performed a cumulative analysis for NO2 and PM10. The cumulative analysis demonstrates that the proposed Facility will not violate the NAAQS and PSD increments for either NO2 or PM10. AGCC did not model emissions of lead (Pb) because the lead emissions were estimated to be insignificant (less than 0.6 tons/yr); thus PSD was not triggered for this pollutant. The proposed Facility's visibility and deposition impacts at Class I areas are below the levels of concern set by the Federal Land Managers (hereafter, "FLMs").

For ozone, AGCC conducted an extensive analysis because EPA has designated neighboring Clark County, NV, as nonattainment for the 8-hour standard ozone standard. The Moapa Paiute reservation, however, is not part of the Clark County 8-hour nonattainment area. [IS THIS RIGHT] (see documents at http://www.epa.gov/oar/oaqps/glo/designations/documents/clark/index.htm). AGCC analyzed wind flow and timing of ozone formation demonstrating that "emissions from the [Moapa Paiute] Reservation area are at most a negligible factor in Las Vegas ozone exceedances". EPA concurs in AGCC's conclusion that "winds do not typically blow southwest from the Reservation toward the Las Vegas urbanized area. For those times when there was southwest flow, it was intermittent and/or inconsistent across stations, or the timing was such that Reservation emissions are unlikely to contribute to ozone exceedances, or it occurred on days when there was no 8-hour ozone exceedance." (Technical Support Document, The Las Vegas 8-Hour Ozone Nonattainment Area, September 8, 2004, page 20). AGCC has also demonstrated that because the proposed Facility's VOC emissions will be relatively small (98 tons/yr), and its maximum NO2 impact will be only 6.7 µg/m3, the proposed Facility will not contribute to any ozone exceedances in the Las Vegas area.

7.1 Meteorological and Background Ambient Air Quality Data

AGCC is required to input representative meteorological data into the appropriate air quality model to generate the ambient impact analysis. AGCC collected on-site meteorological data, in compliance with a monitoring protocol approved by EPA with input from both the Nevada Division of Environmental Protection (NDEP) and the Clark County Department of Air Quality & Environmental Management (DAQEM). The instrument accuracies and the calibration and audit procedures prescribed in the protocol met EPA recommendations in Meteorological Monitoring Guidance for Regulatory Modeling Applications (EPA-454/R-99-005, February 2000, hereafter "MMGRMA"). AGCC selected additional surface characteristics parameters (e.g. surface roughness) according to land use tables in MMGRMA, with EPA concurrence.

The analysis also requires representative background air quality data. For the NAAQS compliance analysis, AGCC added background concentrations to modeled concentrations, and then compared the total concentrations to the NAAQS. DAQEM provided the background concentrations to AGCC. PM10 concentrations were taken from a monitor at Great Star

Cement, while NO2 was taken from Harry Allen Station, both in Apex Valley, southwest and upwind of the location of the proposed Facility on the Reservation. Although the monitors are approximately 40 kilometers away, the monitored data from the Apex Valley provides a conservative estimate (i.e. over-estimate) of background concentrations. The Apex Valley monitors likely over-estimate the actual background concentrations at the proposed Facility because Apex Valley has far greater commercial and industrial activity than the area near the proposed Facility on the Moapa Paiute Reservation.

7.2 Modeling Methodology

For air quality impact analyses, EPA guidance recommends either ISCST3 or the newer AERMOD dispersion model. AGCC used AERMOD, which has a more sophisticated treatment of turbulence and dispersion. For analyzing potential impacts on Class I areas, the FLMs recommend using the CALPUFF model, which is also the model recommended in EPA guidance for long distance (over 50 km) estimates. AGCC used the CALPUFF model for evaluating potential impacts at Class I areas.

In addition to the meteorological inputs discussed above, an air quality model needs inputs characterizing emissions sources. AGCC modeled the proposed Facility's emissions at the maximum allowable emission rates in the proposed PSD permit. Modeling at the maximum allowable emission rates guarantees that AGCC has made a conservative (i.e. over-estimated) air quality assessment. AGCC's inputs for sources also include stack height, temperature, and exit velocity, because these factors determine the plume's buoyancy and momentum, and hence its distance from the ground. Nearby buildings can cause plume downwash, leading to high pollutant concentrations. However, AGCC used the appropriate model option to simulate this effect, using the BPIP software EPA provides for that purpose, and the PRIME algorithm within AERMOD. AGCC modeled two different scenarios for estimating PM10 concentrations, reflecting limestone mining at the North and South quarries, respectively. AGCC's procedures for both scenarios met EPA guidelines.

AGCC's final inputs were the locations, or receptors, at which the model will compute pollutant concentrations. AGCC complied with good receptor placement procedures according to EPA guidelines. AGCC's original modeling included a set of receptors out to 50 km from the proposed Facility, which is standard for Class II area analyses. This modeling showed that the significant impact area was considerably smaller, so AGCC's final modeling was appropriately limited to 18 km from the proposed Facility. AGCC used progressively more closely spaced receptors nearer to the proposed Facility, culminating in 50 meter spacing at the project fence line. AGCC used other sets of receptors and ran models as prescribed by the FLMs for each of the two Class I areas located within 200 km of the proposed Facility: the Grand Canyon and Zion National Parks.

A project must not have a "significant" contribution to a violation of the NAAQS or of the PSD increment. That is, the applicant must show that its own impact is below the Significant Impact Level (SIL), or else show that there is no violation at locations where its impact is above the SIL. The project's impact is not significant for SO2 and CO, so this is sufficient to show the project's

compliance with the NAAQS and PSD increment for those pollutants.

EPA policy provides that if the modeled concentration of any pollutant exceeds the SIL, AGCC is required to perform an additional analysis to show that the cumulative effects of the proposed Facility's emissions together with the emissions from other nearby sources will not cause a violation of the NAAQS or PSD increments. The proposed Facility's modeled emissions exceed the SIL for PM10 [I AM NOT SEEING THE PM10 EXCEEDANCE?] and NO2 impacts in its surrounding Class II area, requiring AGCC to perform cumulative analyses for those pollutants. AGCC's CALPUFF modeling demonstrated that the proposed Facility would not have a significant impact on either of the Class I area impacts, so AGCC was not required to perform a cumulative Class I analysis.

The proposed Facility's modeled impacts, along with the SILs, NAAQS and Class II increments, are shown below.

Maximum Predicted Air Quality Impacts from the Proposed Project

Pollutant	Averaging Period	Modeled Impact	SIL ($\mu g/m^3$)	PSD Class II Increment ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	Annual	**2.2**	1	25	100
SO_2	3-hour	11	25	512	1300
	24-hour	2.2	5	91	365
	Annual	0.4	1	20	80
PM10	24-hour	> 10	5	30	150
	Annual	> 1	1	17	50
CO	1-hour	756	2000	N/A	40000
	8-hour	180	500	N/A	10000

(from application, tables 5-5 through 5-8; bold indicates impact greater than SIL)

Maximum Predicted Air Quality Impacts from the Project at Class I Areas

	Pollutant and Averaging Time

Class I Area	NO_2	SO_2			PM10	
	Annual	**3-hour**	**24-hour**	**Annual**	**24-hour**	**Annual**
Grand Canyon NP	0.00126	0.1712	0.0293	0.0016	0.0079	0.0007
Zion NP	0.0010	0.0425	0.0153	0.0010	0.046	0.003
Proposed Class I SIL	0.1	1.0	0.2	0.1	0.3	0.2
PSD Class I Increment	2.5	25.0	5.0	2.0	8.0	4.0

(from application, tables 6-19 through 6-14)

7.3. NAAQS Compliance

As discussed above, AGCC performed cumulative analyses for PM10 and NO2 by including the proposed Facility's maximum emissions with the emissions of nearby sources to show NAAQS compliance. DAQEM provided the data on nearby source emissions to AGCC. DAQEM's data showed twenty sources in the Apex Valley to the southwest and also just northeast and east of the proposed Facility's location on the Reservation. The results of the cumulative NAAQS analysis are shown in the table below. The results, including the monitored background concentration, are less than half the NAAQS in every case. The applicant has thus demonstrated compliance with all the NAAQS.

Predicted Cumulative Air Quality Impacts on the NAAQS

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Background Concentrations ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	annual	6.7	2.0	8.7	100
PM10	24-hour	29.2	26.2	55.4	150
	Annual	11.0	11.0	22.0	50

(from application, tables 5-15 through 5-16)

Note: For the cumulative analysis, because of the way the NAAQS are defined, the second highest predicted concentration is compared to the NAAQS level. Thus some values in this table may be lower than the "Maximum Predicted Impact" table 15, where the first high is used, to

provide a more conservative assessment of whether the Facility has any impacts above the SIL.

7.4. Increment Consumption Analysis

The cumulative analysis for PSD increment is conceptually more complicated than that for the NAAQS, because not all emissions "count" toward, or consume, increment. Only emissions changes that have occurred since the "baseline date" count towards increment consumption because the CAA's PSD program is intended to prevention significant deterioration in the area relative to the baseline conditions that existed when Congress enacted the PSD program. For the same reason, decreases in cumulative actual emissions expand the available increment because such decreases improve air quality relative to the baseline. The PSD increment analysis relies on good tracking of emission changes over time by regulatory authorities at the State and local levels. For this analysis, AGCC was able to use essentially the same DAQEM emissions database that it used for the NAAQS analysis.

The results of the cumulative PSD increment analysis are shown in the table below. The results, are below the Class II increments. (No cumulative Class I analysis was required because Class I impacts from the project were not significant where they are respectively applicable. The applicant has thus demonstrated compliance with the PSD increments.

Predicted Cumulative Air Quality Impacts on the Class II Increments

Pollutant	Averaging Period	Modeled Impact	Increment ($\mu g/m^3$)
NO_2	Annual	6.5	25
PM10	24-hour	28.9	30
	Annual	10.6	17

(from application, tables 5-11 through 5-12)

8.0 ADDITIONAL IMPACT ANALYSIS

In addition to assessing the ambient air quality impacts expected from a proposed new source or modification, the PSD regulations require that certain other impacts be considered. These include impacts on visibility, soils and vegetation, and growth.

8.1 Visibility and other Air-Quality Related Values

The applicant modeled the project's impact on visibility and on other Air-Quality Related Values (AQRVs), which are defined by the Federal Land Manager (FLM) for each Class I area. This was

done after discussion of modeling procedures with the National Park Service and EPA.

The "Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report" (USFS, NPS, US F&WS, December, 2000), also known as the "FLAG document" prescribes procedures for assessing impacts on Class I areas. The applicant followed the FLM-recommended procedures for using CALPUFF along with the post-processing program CALPOST, for assessing acid deposition impacts and regional haze impacts. The modeled sulfur and nitrogen deposition were below the FLMs' "Deposition Analysis Thresholds" (DATs) of 0.005 kg/ha/yr (kilograms per hectare per year). Therefore, the FLMs did not require further analysis. Absent an official finding to the contrary, EPA deems that there is no adverse impact on AQRVs related to deposition.

For assessing regional haze impacts, the FLAG document prescribes a screening procedure based on changes in extinction (the attenuation of transmitted light, per unit distance) caused by the project. CALPUFF predictions for sulfate, nitrate, and particulate matter are multiplied by the light extinction capacity of each; daily averages of the resulting total extinction increase above natural background is compared to the 5% level, which indicates an amount of haze just perceptible to an observer. If any day is greater, the screen is failed and the FLAG document recommends additional analysis to assess whether there is an adverse impact (though it does not describe the additional analysis needed).

The applicant carried out the FLAG screening procedure. The applicant used mesoscale meteorological data from 1992, 1993, and 2003 (previously made available by EPA), and assimilated National Weather Service meteorological observations into it using the CALMET preprocessor. The analysis found no days over the 5% concern level; the maximum was 4.36% for Zion for the 2003 meteorology year.

EPA's conclusion from the analyses is that there are no adverse impacts on Class I areas.
The applicant performed an additional "plume blight" visibility analysis for Lake Mead, using EPA's VISCREEN model and a "Level II" analysis per EPA's Workbook for Plume Visual Impact Screening and Analysis (EPA-450/4-88-015, September 1988). The "Level II" analysis uses actual meteorological data instead of worst case meteorology. The results for both contrast and color contrast were below the default levels of concern in the EPA guidance.

8.2 Soils and Vegetation

The PSD regulations require analysis of air quality impacts on sensitive vegetation types, with significant commercial or recreational value, and sensitive types of soil. Evaluation of impacts on sensitive vegetation was performed by comparing project impacts to the secondary NAAQS. The primary and secondary NAAQS for PM10 and NO2 are the same; since the project impact is below the primary NAAQS, it also meets the secondary NAAQS. For SO2, the secondary NAAQS is higher than the primary, so project also meets this. There is no secondary CO NAAQS. (The NAAQS are defined in 40 CFR §50.4 through §50.12).

9.0 ENDANGERED SPECIES ACT

Pursuant to Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, and its implementing regulations at 50 C.F.R. Part 402, EPA is required to ensure that any action authorized, funded, or carried out by EPA is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of such species' designated critical habitat. EPA has determined that this PSD permitting action triggers ESA Section 7 consultation requirements. EPA is therefore required to consult with the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS) if an endangered species or threatened species may be present in the area affected by the permit project and EPA's action (i.e., permit issuance) may affect such species. EPA is also required to confer with the Services on any action which is likely to jeopardize the continued existence of any species proposed for listing (as endangered or threatened) or result in the destruction or adverse modification of habitat proposed to be designated as critical for such species.

When a Federal action involves more than one agency, consultation and conference responsibilities may be fulfilled through a lead agency pursuant to 50 CFR § 402.07. Since the land, electrical transmission lines, and access roads required for the proposed project are located on the Navajo Indian Reservation and lands under the jurisdiction of the Bureau of Indian Affairs (BIA), the BIA will act as the lead Federal agency for purposes of fulfilling the responsibilities under Section 7 of the ESA for the project.

EPA may proceed with the final permit issuance upon conclusion of consultation, review of FWS's Biological Opinion, and our determination that issuance of the permit will be consistent with the ESA requirements.

10.0 CONCLUSION AND PROPOSED ACTION

Based on the information supplied by the Ash Grove Cement Company and our review of the analyses contained in the permit application, it is our preliminary determination that the proposed project will employ BACT and will not cause or contribute to a violation of the NAAQS, or an exceedance of PSD increments. Therefore, EPA proposes to issue Ash Grove Cement Company a permit for the Moapa Paiute project, subject to the permit conditions specified herein. This permit is subject to review and comments. A final decision on issuance of the permit will be taken after considering comments received during the public comment period and upon completion of the ESA consultation process.