E. Air Quality

An air quality analysis of the proposed Palomar Aggregates Quarry was performed by AWR Engineering Group in January of 1988 (Appendix K). This original report was updated in 1991 and 1996 to reflect current regulations. The following section is a summary of the 1996 report.

1. Existing Conditions

Air Quality Strategies

In an effort to improve the nation's air quality, Congress passed the Clean Air Act in 1970. This Act, and subsequent amendments, required federal air quality standards to be set and enforced by the Environmental Protection Agency (EPA). State and local agencies were also established to develop air quality strategies, monitor compliance with federal standards, and regulate emission sources.

The California Air Resources Board (CARB) regulates of mobile sources of emissions, primarily motor vehicle pollution. Regulation of stationary emissions, such as the proposed aggregate plant and the asphalt and concrete batch plants, is the responsibility of the San Diego County Air Pollution Control District (SDAPCD). This agency also prepares the State Implementation Plan (SIP) and a Reasonable Further Progress Report for the San Diego area.

State Implementation Plans became mandatory after an amendment to the Federal Clean Air Act in 1977. The SIP must address control strategies for the five major pollutants (ozone, carbon monoxide, particulate matter, nitrogen dioxide, and sulfur dioxide). Attainment levels were to be met by 1982; however, for those areas which could not meet this deadline, an extension was given until 1987 to attain the standards. Attainment levels for carbon monoxide, nitrogen oxide and sulfur dioxide have been met for the San Diego region. Compliance with ozone standards continues to be a problem for the San Diego region, related in large part to meteorological conditions which transport ozone from the Orange/Los Angeles County areas to San Diego.

An extension for ozone compliance was received with a requirement to submit a revision to the existing SIP. The SDAPCD revised the SIP in 1994, and is forecasting attainment of the Federal ozone standard by the required date of 1999.

Hydrocarbons and nitrogen oxides emitted from mobile and stationary sources react with sunlight to produce ozone, commonly referred to as smog. The control strategy for ozone is to reduce reactive hydrocarbon emissions, more than half of which are produced by motor vehicles.

Prior to 1987, particulate matter was measured as Total Suspended Particulate. In 1987, the standard was changed to measure only that portion of particulates which are less than ten microns in diameter, known as PM_{10}. These are the particles which present the greatest threat to human health. For PM_{10}, the San Diego Air Basin is unclassified.

In addition to the SIP, the APCD is also required to prepare annually Reasonable Further Progress (RFP) Reports to assess progress in attaining healthful air quality in the San Diego region. The

Federal Clean Air Act defines Reasonable Further Progress as "annual incremental reductions of emissions of the applicable air pollutant which are sufficient in the judgment of the Administrator of the Environmental Protection Agency to provide for attainment of the applicable national ambient air quality standard by the date required". The report's primary objective is to reaffirm the validity of claims made in the SIP reports, and to prevent future emission trends from interfering with attainment of air quality standards. The next RFP is expected to continue to focus on control strategies for ozone, which remains the major pollution problem in San Diego.

The major emphasis of the SDAPCD's efforts is on "new source review" which requires regulated activities, such as the Proposed Project, to obtain "Authority to Construct" and "Permit to Operate". Four sets of SDAPCD regulations are applicable to the proposed aggregate plant, hot-mix asphalt plant and concrete batch plant:

- Prohibitive Standards that limit the amount of emissions from each process;
- New Source Performance Standards (NSPS) that require stricter controls for the proposed hot-mix asphalt and aggregate plants; and,
- New Source Review Standards that require Best Available Control Technology (BACT) be applied to all portions of the proposed facility, and that the air quality impacts of all proposed quarry operations be fully evaluated if emissions exceed certain threshold values. BACT is defined as the "maximum degree of air contaminant reduction which the Air Pollution Control District determines is achievable".
- Federal EPA Title V Standards that would require a Federal operating permit if certain annual emission thresholds are exceeded.

The APCD's regulations forbid construction until the entire proposed facility can demonstrate that it would comply with all four sets of standards.

Local Conditions

The general climate at the proposed project site is largely governed by the semi-permanent high pressure system over the Pacific Ocean and the atmospheric interaction between the cool ocean and the warm desert interior. The San Luis Rey Valley's sub-climate is somewhat warmer than the county's coastal corridor in the summer, and experiences less cloud cover and fog than along the ocean. A morning breeze, resulting from local heating of the east and south facing slopes, travels northwards at the proposed quarry. By mid-to late morning the regional sea breeze penetrates the area and these winds from the southwest and west are generally light until mid-afternoon. A stronger breeze then prevails until late evening, especially in the summer and on the higher hills on either side of I-15. At night the winds are primarily offshore, especially in the winter, when they drain down off the hills surrounding the area and flow south before heading southwest down the river channel. The annual average temperature is 62° Fahrenheit. Winter mornings drop down into the upper 30s and summer afternoons reach the low 90s. Temperature extremes over 100° or much below freezing rarely occur because of the moderating influence of the ocean to the west. Annual rainfall averages approximately 14 inches, most of which occurs from late November until early April.

There are no recent air quality monitoring data available from the Pala Mesa area by which existing compliance with clean air standards can be determined. The nearest San Diego Air Pollution Control District monitoring station is in Escondido, approximately 15 miles to the south of the project site. Of the gaseous pollutants measured at the Escondido monitoring station, only the level of ozone exceeded the Federal clean air standard during the period 1990-1994. The Pala Mesa area is expected to have lower levels of carbon monoxide and nitrogen oxides than Escondido, with little probability of any violations, due to its lower level of urban development.

The nearest PM_{10} measurement sites to Pala Mesa are Oceanside (19 miles to the west) and Escondido (13 miles to the south); PM10 monitoring at these sites show compliance with Federal standards. No violations of the federal annual or 24 hour standard for PM_{10} have been recently recorded in San Diego County; however, the state annual standard and 24 hour standards were not met at several county monitoring stations during the period between 1990-1994.

2. Environmental Impacts

The major source of air pollutants in aggregate mining and processing activities occurs from the release of dust particles during excavation, processing and hauling. This release of dust is commonly referred to as "fugitive emissions". With respect to a rock quarry, the initial blasting, crushing, and transfer of aggregate are the major sources of fugitive emissions. The emissions generated by blasting are not calculated into the total particulate emission estimate, however, since information on blasting at stone quarries is, according to EPA document AP-42 (Rev 9/88) Section 8.19.2, sparse and unreliable.

If not properly controlled, fugitive dust could be dispersed throughout the area and settle on nearby parked vehicles, structures, outdoor furniture, and foliage. The distance dust would be carried depends on the wind velocity, the particle size, the altitude to which it would rise, and topographical features which would influence air flow. The early morning breezes would carry the dust northward, toward the existing nearby Pankey residence and groveland. By mid to late morning the dust would be carried more to the northeast and east, towards a hill which remains covered with natural vegetation. The western slope of the project site would shield the quarrying activities from the westerly winds, so only the finer particulate which have risen to higher altitudes would be carried by these winds. Beyond the hill to the east are existing farmlands which may receive some of the dust, especially later in the afternoon when the wind velocities have increased. Existing grovelands immediately to the southwest would not receive much dust unless there is no wind or a Santa Ana condition exists.

A second source of air quality impacts is gaseous pollutants which are generated in the preparation of hot-mix asphalt and by combustion emissions from vehicles involved in the mining and transporting of aggregate materials. Only those generated by the production of asphalt are addressed in this report, since the vehicular emissions are a regional issue and would result primarily from the transport of the products for use throughout the area.

Fugitive Particulate Emissions

Fugitive particulate emissions have been calculated for each source, other than blasting for dust particles less than 10 microns in diameter (PM_{10}). Estimates of fugitive particulate emissions, are summarized in Table 11. These estimates are based on application of BACT and other control measures described in this report and on project plot plans.

Table 11. Estimate of Particulate Emissions (PM_{10})

Source	Pounds/Hour	Pounds/Day	Tons/Year
Processing	12.98	95.1	10.13
Crushing & Screening	8.23		
Asphalt Production	4.36		
Concrete Production	0.39		
Handling, Transfer & Storage	12.27	82.7	9.54
Drilling	0.07		
Material Handling	2.30		
Aggregate Transfer	5.96		
Wind Erosion	3.94		
Haul Roads	14.28	111.0	11.11
Quarry	10.67		
Aggregate	1.99		
Raw Materials	0.37		
Asphalt	0.64		
Concrete	0.61		

Processing particulate emissions generated by the crushing and screening to produce 625 tons/hour of aggregate are estimated to be 8.23 pounds/hour PM_{10}, and are based upon the assumption that BACT is utilized. Control measures include the use of fabric filters and the use of water/surfactant sprays to create a higher dust control efficiency. The use and/or effectiveness of fabric filters would be:

Jaw Crusher:	90 percent with fabric filter on discharge.
Cone Crushers:	95 percent with fabric filter on discharge.
Screening:	99 percent with covered screen and surfactant.
Recrushing:	99 percent with insertable fabric filter on discharge.

The production of hot-mix asphalt would involve combining various sized aggregate, sand and asphaltic cement and would require a fabric filter (baghouse) system for control of the particulate emissions. Due to the New Source Performance Standards currently in effect, such a baghouse system would provide 60 percent cleaner exhaust than is achieved at existing asphalt plants in San

Diego County. Assuming an asphalt production rate of 350 tons/hour maximum, the PM_{10} emissions would be 4.4 pounds/hour.

Particulate emissions associated with the concrete batch plant would consist of cement dust and aggregate dust, from the conveyance and unloading of these materials. Control measures would include the enclosure of dumping and loading areas, pneumatic conveyance for transfer of cement, filters on storage bin vents and the use of water sprays. These techniques would provide overall dust control efficiencies of at least 90 percent and limit the PM_{10} emissions to 0.39 pounds/hour.

Fugitive emissions associated with operation of the rock plant have been identified in four areas: drilling in the quarry area, rock handling in the quarry area, stockpiling and loadout operations in the plant, and wind erosion of stockpiles. Average emissions associated with drilling are calculated to be 0.07 pounds/hour PM_{10}, based on 250 days of drilling. Material handling within the quarry would involve transferring the quarried material onto the grizzly feeding the jaw crusher. Assuming a handling rate of 625 tons/hour, an estimated 2.30 pounds/hr PM_{10} fugitive emissions would be generated. The transference of material to stockpiles, load-out bins, and into haul trucks would produce an estimated 5.96 pounds/hour PM_{10} emissions. This figure is based on the assumption that the material would be moist from water sprays located on each stockpiling conveyor. Wind erosion across the storage piles would generate a maximum 3.94 pounds/hour PM_{10} fugitive emissions.

In addition to fugitive dust generation from production, traffic within the project site could generate dust from the access road, and thereby increase the level of particulate in the air. It is anticipated that there would be approximately 1,500 round trips per month (68 round trips per working day) associated with off-site delivery of ready-mix concrete, and 3,100 round trips per month (141 round trips per working day) for aggregate or asphalt delivery. Employees and miscellaneous trips would add approximately 31 round trips per day, generating a total "worst case" estimate of 240 round trips per day. Due to SDAPCD's Regulations that require paved haul roads at the facility rather than the chemical stabilization of unpaved haul roads, fugitive emissions would be significantly reduced. Additionally, recent field investigations at similar mineral products industry facilities have shown an 80 percent efficiency in controlling particulate emissions when the road surface is wet swept routinely, coupled with watering the paved surface to further suppress airborne dust emissions.

Assuming that the haul roads are paved, aggregate haul trucks are expected to generate 1.99 pounds/hour PM_{10} emissions. The importation of asphaltic cement, portland cement, and sand, all of which would be brought on-site in 25 ton loads on paved haul surfaces, would generate 0.37 pounds/hour PM_{10} emissions, assuming a maximum of two trucks of each type of raw material arriving in any one hour. The hauling of hot-mix asphalt would generate 0.64 pounds/hour PM_{10} emissions and hauling of ready-mix concrete would generate 0.61 pounds/hour PM_{10} emissions. Equipment within the quarry is expected to generate 10.67 pounds/hour PM_{10} emissions while transporting quarried material, assuming the pit-area and adjacent traveled surfaces are watered two times a day (before commencing work in the morning and at lunch time).

SDAPCD's New Source Review Rules utilize three thresholds to determine the District's level of project review. If estimates of particulate emissions exceed 10 pounds/day utilizing standard dust control measures, then BACT is required to be implemented. In addition, a threshold of 100 pounds per day is established to evaluate whether process PM_{10} emissions once BACT is employed, could potentially cause significant off-site air quality impacts. If this threshold is exceeded, detailed air

quality modeling is required by APCD. As shown in Table 11, PM_{10} daily emissions would exceed the 10 pounds/day threshold of Rule 20.2, and BACT would be required for the entire facility.

The maximum of 95.0 pounds/day of process PM_{10} emissions, with BACT, would not exceed the 100 pounds/day threshold established by the SDAPCD Standards. These sources are not expected to cause a significant off-site air quality impact and detailed air quality modeling would not be required by the District. The maximum 10.1 tons/year of PM10 emissions calculated for the facility would not exceed the SDAPCD's threshold of 15 tons/year, so that no emission offsets would be required. The Proposed Project would be in compliance with the SDAPCD Prohibitive Standards, New Source Performance Standards, New Source Review Rules, and Federal EPA Title V Permit Rules.

Fugitive PM_{10} emissions would be generated by blasting. As noted above, the U.S. EPA has revised the list of emission factors for crushed stone operations to eliminate the factor for blasting emissions. The EPA cited the sparsity and unreliability of available test data, and specified that the use of previous estimation techniques was to be discontinued. Blasting would be an infrequent source of fugitive emissions at the facility, and emissions which occur on an irregular basis are not usually included in the SDAPCD's summation of hourly and daily emissions. To ensure that dust from blasting does not add to dust from routine operations, all blasting would be conducted on Saturdays.

Gaseous Emissions

The utilization of BACT methods were also assumed for predicting the gaseous emissions generated by the production of hot-mix asphalt (Table 12). These emissions are not expected to significantly increase the existing levels of these pollutants in the region. Although hot-mix asphalt production would result in the generation of nitrogen oxides which, when mixed with other pollutants in the presence of sunlight, results in ozone (the gaseous pollutant that already has levels exceeding the clean air standard), the project's off-site impact is very insignificant (Table 13).

Table 12. Gaseous Emissions From Asphalt Plant

Pollutant	Stack Gas Conc. (PPM)	Maximum Pounds/Hour	Maximum Pounds/Day
Carbon Monoxide	200	24.5	147.8
Nitrogen Oxides	65	13.2	78.9
Sulfur Oxides	40	11.3	67.6

Emissions of gaseous pollutants from haul trucks can be estimated by using the current California Air Resources Board (ARB) emission factors for heavy duty diesel trucks.

These emissions are:

Carbon Monoxide = 10.14 grams per mile
Nitrogen Oxides = 14.12 grams per mile
Sulfur Oxides = 0.55 grams per mile

Table 13. Gaseous Emissions from Project Operations

Pollutant	Haul Trucks	Asphalt Plant	On-site Equipment	Total Project	All Sources County Wide
Daily Emissions (Pounds)					
CO	158.7	147.8	33.1	340.0	2,800,000
NO_x	221.0	78.9	176.0	476.0	440,000
SO_2	8.6	67.6	11.1	87.0	38,000
Yearly Emissions (Tons)					
CO	15.87	14.78	4.14	35.00	511,000
NO_x	22.10	7.89	22.00	52.00	80,300
SO_2	0.86	6.76	1.39	9.00	6,935

Total daily miles can be estimated from the daily haul truck trips (452) and mileage to the various destinations (17 miles to Escondido, 11 miles to Temecula, and 18 miles to Oceanside/Carlsbad) noted in the Traffic/Circulation Section of this FEIR. The maximum miles traveled are estimated to be 7,100 miles per day.

These assumptions would yield a total of 158.7 pounds per day of carbon monoxides, 221.0 pounds per day of nitrogen oxides, and 8.6 pounds per day of sulfur oxides.

The daily and annual emissions of gaseous pollutants associated with plant operation, including those from quarry equipment and the asphalt plant, are presented in Table 13, in comparison to county-wide pounds per day and tons per year emissions from all sources.

Under the Federal Clean Air Act of 1970, a comprehensive, basin-wide plan for attaining and maintaining air quality standards is required. The State Implementation Plan Revisions forecast the level of emissions anticipated in the future, including the planned growth of new sources. The San Diego Association of Governments population projections were used for such forecasts.

Since the Proposed Project does not, itself, create growth, but rather provides construction materials to support planned growth, it would not conflict with state or local air quality programs.

The impact of all project-related emissions is both local and regional in nature. The very fine particulate generated on the property, as well as the emissions generated by heavy-duty trucks traveling within the County, would be distributed throughout the San Diego Air Basin and add to the cumulative effects of pollution-generating activities within the region.

3. Summary of Impact Significance

Air quality impacts are significant but mitigable. All significant impacts would be mitigated to a level below significance with implementation of Best Available Control Technologies and specific project design features including enclosures, screens and filters.

4. Mitigation Measures

The following operational requirements, which appear as notes on project plans and/or assumptions in the technical report as Best Available Control Technology, represent current SDAPCD standards and shall be followed in project operations. Monitoring and compliance with these operational techniques are included in the Mitigation Monitoring program for the project. Implementation of the following air pollution control measures, together with the SDAPCD permitting requirements would adequately mitigate potential air quality impacts.

E-1. As a condition of operation, no blasting shall take place when wind velocity equals or exceeds 15 miles per hour. A licensed blasting contractor shall determine wind speed through the use of an anometer located a minimum of 10 feet above ground level near the on-site project office.

E-2. As a condition of operation, dust emissions from all crushing operations shall be controlled by venting to a fabric filter system.

E-3. As a condition of operation, stockpiles of sand shall be kept moist or shall be watered before reaching transfer points.

E-4. As a condition of operation, visible emissions from transfer points shall not exceed 20 percent opacity at any time.

E-5. As a condition of operation, unpaved haul roads will be chemically stabilized to minimize dust emissions to below the requirements of APCD Rule 50 (20 percent opacity). In lieu of chemical stabilization, watering of haul roads at least every two hours will be required.

E-6. Initial clearing of areas to be mined, including removal and stockpiling of topsoil, shall be accompanied by surface watering to control dust generation.

E-7. As a condition of operation, the area traversed by the quarry equipment shall be watered two times a day (once prior to commencing work in the morning and once at mid-day).

E-8. As a condition of operation, screens and secondary crushers would be fully enclosed except for the openings necessary to accommodate the conveyor belts.

E-9. As a condition of operation, other dust control methods, as necessary, must be applied to any dust-producing condition which may develop at the borrow pit, which would result in a nuisance from this operation (APCD Rule 51).

E-10. As a condition of operation, the transfer of cement shall be only by pneumatic conveying. There shall be no leaks of cement dust to the atmosphere anywhere within the transfer system.

E-11. As a condition of operation, the hot-mix asphalt plant shall have a fabric filter (baghouse) system.

E-12. As a condition of operation, covers for hot-oil storage tanks must be kept in place unless the tanks are being filled. The condenser system for fugitive blue-smoke emissions shall be fully operational.

E-13. As a condition of operation, the temperature of batched hot-mix asphalt shall not exceed 330° F.

E-14. As a condition of operation, loading bins shall be enclosed.

E-15. As a condition of operation, water sprays shall be used during the loading/unloading operations for aggregate and stockpile materials, if visible emissions are present.

E-16. As a condition of operation, quarry operations shall shut down when wind speed exceeds 20 miles per hour as determined by an on-site anemometer.

E-17. As a condition of operation, only unleaded gasoline and diesel fuel containing less than 0.05% sulfur shall be used in the on-site equipment.

E-18. As a condition of operation, the project shall comply with all APCD rules and regulations applicable to new quarry operations, including APCD Rule 20.2.

5. Summary of Impacts After Mitigation

Based on the use of these air pollution control techniques which would control emission below threshold levels considered significant by APCD (i.e., 100 pounds/day of process PM_{10} emissions), no significant air quality impacts would result from the project as proposed.