4.3 Air Quality

This section evaluates the potential impacts of the proposed Reclamation Plan Amendment (RPA or Project) on regional and local air quality from both stationary and mobile sources of air pollutant emissions. Development of this section was based on a review of existing documentation of air quality conditions in the region, air quality regulations from the United States Environmental Protection Agency (U.S. EPA), the California Air Resources Board (CARB), the Bay Area Air Quality Management District (BAAQMD), information related to the Project Description, and the analysis in the Ashworth Leininger Group (ALG) *Air Quality Technical Analysis – Revised Reclamation Plan Amendment* (ALG, 2011a).

4.3.1 Setting

4.3.1.1 Environmental Setting

General Climate and Meteorology

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

The Quarry, including the Project Area, is located in an unincorporated area of the western foothills of Santa Clara County near the City of Cupertino, within the boundaries of the San Francisco Bay Area Air Basin (Bay Area Air Basin). The Bay Area Air Basin encompasses all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo and Santa Clara Counties, and the southern portions of Solano and Sonoma Counties.

The climate of the San Francisco Bay Area is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the West Coast of North America. High-pressure systems are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. In winter, the Pacific high-pressure system shifts southward, allowing storms to pass through the region. During summer and fall, emissions generated within the San Francisco Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants such as ozone.

More specifically, the Project Area is located in the Santa Clara Valley climatological subregion. As summarized by the BAAQMD in the *CEQA Air Quality Guidelines* (BAAQMD, 2011a), the Santa Clara Valley is bounded by the Bay to the north and by mountains to the east, south and west. Temperatures are warm on summer days and cool on summer nights, and winter temperatures are fairly mild. At the northern end of the valley, mean maximum temperatures are in the low-80s during the summer and the high-50s during the winter, and mean minimum temperatures range from the high-50s in the summer to the low-40's in the winter. Further inland, where the moderating effect of the Bay is not as strong, temperature extremes are greater. Winds in the valley are greatly influenced by the terrain, resulting in a prevailing flow that roughly parallels the valley's northwest-southeast axis. A north-northwesterly sea breeze flows through the valley during the afternoon and early evening, and a light south-southeasterly drainage flow occurs during the late evening and early morning. In the summer the southern end of the valley sometimes becomes a "convergence zone," when air flowing from the Monterey Bay gets channeled northward into the southern end of the valley and meets with the prevailing north-northwesterly winds. Wind speeds are greatest in the spring and summer and weakest in the fall and winter. Nighttime and early morning hours frequently have calm winds in all seasons, while summer afternoons and evenings are quite breezy. Strong winds are rare, associated mostly with the occasional winter storm.

Existing Air Quality – Criteria Air Pollutants

The BAAQMD operates a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants within the Bay Area. Existing levels of air pollutants in the Project Area can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its nearby monitoring stations. Notably, the Leigh Permanente Quarry and Cement Plant generate emissions that have raised concerns from the surrounding residents and public, and as such, the BAAQMD established a monitoring trailer at Monta Vista Park, near the intersection of South Foothill Boulevard and Voss Avenue, in September 2010 with the data posted on the BAAQMD website (BAAQMD, 2010a). To date, only "raw" unchecked data for this monitoring station are available on the BAAQMD website. However, the nearest permanent station in Santa Clara County to the Project Area is the Jackson Street station in San Jose, approximately 10 miles to the northeast. The Jackson Street station measures criteria pollutants, including ozone, PM10 ("inhalable" particulate matter, with a diameter of 10 microns or less), and PM2.5 ("respirable" particulate matter, with a diameter of 2.5 microns or less). **Table 4.3-1** shows a 4-year summary of monitoring data for ozone and particulates at the Jackson Street station. The table also compares these measured concentrations with state and federal ambient air quality standards.

Motor vehicle transportation, including automobiles, trucks, transit buses, and other modes of transportation, is the major contributor to regional air pollution. Stationary sources were once important contributors to both regional and local pollution, and remain significant contributors in other parts of the state and country. Their role has been substantially reduced in recent years by pollution control programs, such as those of the BAAQMD. Any further progress in air quality improvement now focuses heavily on transportation sources.

Existing Air Quality – Toxic Air Contaminants

The ambient background of toxic air contaminants (TACs) is the combined result of many diverse human activities, including gasoline stations, automobiles, dry cleaners, industrial operations, hospital sterilizers, and painting operations. In general, mobile sources contribute more significantly to health risks than do stationary sources. Both BAAQMD and CARB operate a network of monitoring stations that measure ambient concentrations of certain TACs that are associated with

TABLE 4.3-1
AIR QUALITY DATA SUMMARY (2007-2010) – JACKSON ST. STATION, SAN JOSE

Pollutant	Monitoring Data by Year			
	2007	**2008**	**2009**	**2010**
Ozone				
Highest 1 Hour Average (ppm)[b]	0.083	**0.118**	0.088	**0.126**
Days over State Standard (0.09 ppm)[a]	0	1	0	5
Highest 8 Hour Average (ppm)[b]	0.068	**0.080**	0.069	**0.086**
Days over National Standard (0.075 ppm)[a]	0	2	0	3
Days over State Standard (0.07 ppm)[a]	0	3	0	3
Inhalable Particulate Matter (PM10)				
Highest 24 Hour Average – State/National (μg/m^3)[b]	**69.1**/64.7	**57.3**/55.0	43.3/41.1	46.8/44.2
Estimated Days over National Standard (150 μg/m^3)[a,c]	0	0	0	0
Estimated Days over State Standard (50 μg/m^3)[a,c]	18.1	6.1	0	0
State Annual Average (State Standard 20 μg/m^3)[a,b]	**21.9**	**23.4**	20.3	19.5
Respirable Particulate Matter (PM2.5)				
Highest 24 Hour Average (μg/m3)[b] – National Measurement	**57.5**	**41.9**	35.0	**41.5**
Estimated Days over National Standard (35 μg/m^3)[a,c]	9.1	5.1	0	NA
State Annual Average (12 μg/m^3)[b]	11.0	11.5	10.1	9.0

[a] Generally, state standards and national standards are not to be exceeded more than once per year.
[b] ppm = parts per million; μg/m^3 = micrograms per cubic meter.
[c] PM10 and PM2.5 is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.

NA = Not Available. Values in **Bold** exceed the respective air quality standard.

SOURCE: CARB, 2011a

strong health-related effects and are present in appreciable concentrations in the Bay Area, as in all urban areas. Ambient concentrations of TACs are similar throughout the urbanized areas of the Bay Area.

There is growing evidence that indicates that exposure to emissions from diesel-fueled engines, about 95 percent of which come from diesel-fueled mobile sources, may result in cancer risks that exceed those attributed to other measured TACs. In 1998, the California Office of Environmental Health Hazard Assessment (OEHHA) issued a health risk assessment that included estimates of the cancer potency of diesel particulate matter (DPM). Because DPM cannot be directly monitored in the ambient air, however, estimates of cancer risk resulting from diesel PM exposure must be based on concentration estimates made using indirect methods (e.g., derivation from ambient measurements of a surrogate compound).

Notably, the BAAQMD has prepared a health risk assessment for the Lehigh Southwest Cement Company precalciner kiln (BAAQMD, 2008), adjacent to the Project Area, and determined that the maximum cancer risk is 4.2 in a million and that the maximum chronic and acute hazard indexes are 0.26 and 0.13, respectively. These values are less than the BAAQMD thresholds of 10 in a million for cancer risk and 1.0 for acute and chronic health hazard indices. In March 2011, Lehigh submitted to the BAAQMD and OEHHA a draft revised health risk assessment for the cement plant. According to the BAAQMD, OEHHA had very little substantive comment on the draft report and they concluded that the HRA was prepared in accordance with the state's guidance (BAAQMD, 2011c). The BAAQMD intends to post the HRA, OEHHA's comment letter, the BAAQMD assessment memo, and an errata sheet on the BAAQMD website, although those files were not available at the time of this analysis. According to the 2011 draft report, for the 2013 production scenario, the maximum cancer risk from the cement plant would be 7.0 in a million and the maximum chronic and acute hazard indexes would be 0.078 and 0.025, respectively. These values are less than the BAAQMD thresholds of 10 in a million for cancer risk and 1.0 for acute and chronic health hazard indices (Lehigh, 2011).

In addition, the U.S. EPA conducted outdoor air monitoring at the Stevens Creek Elementary School (located approximately 1.5 miles east-northeast of the cement plant) from June through September 2009 to assess hexavalent chromium level exposure from the cement plant. The U.S. EPA determined that levels of hexavalent chromium at the school were below levels of concern for short-term and long-term exposure during the monitoring period (U.S. EPA, 2010). The BAAQMD has continued monitoring at the school to collect a full year of data pursuant to the BAAQMD's monitoring policy.

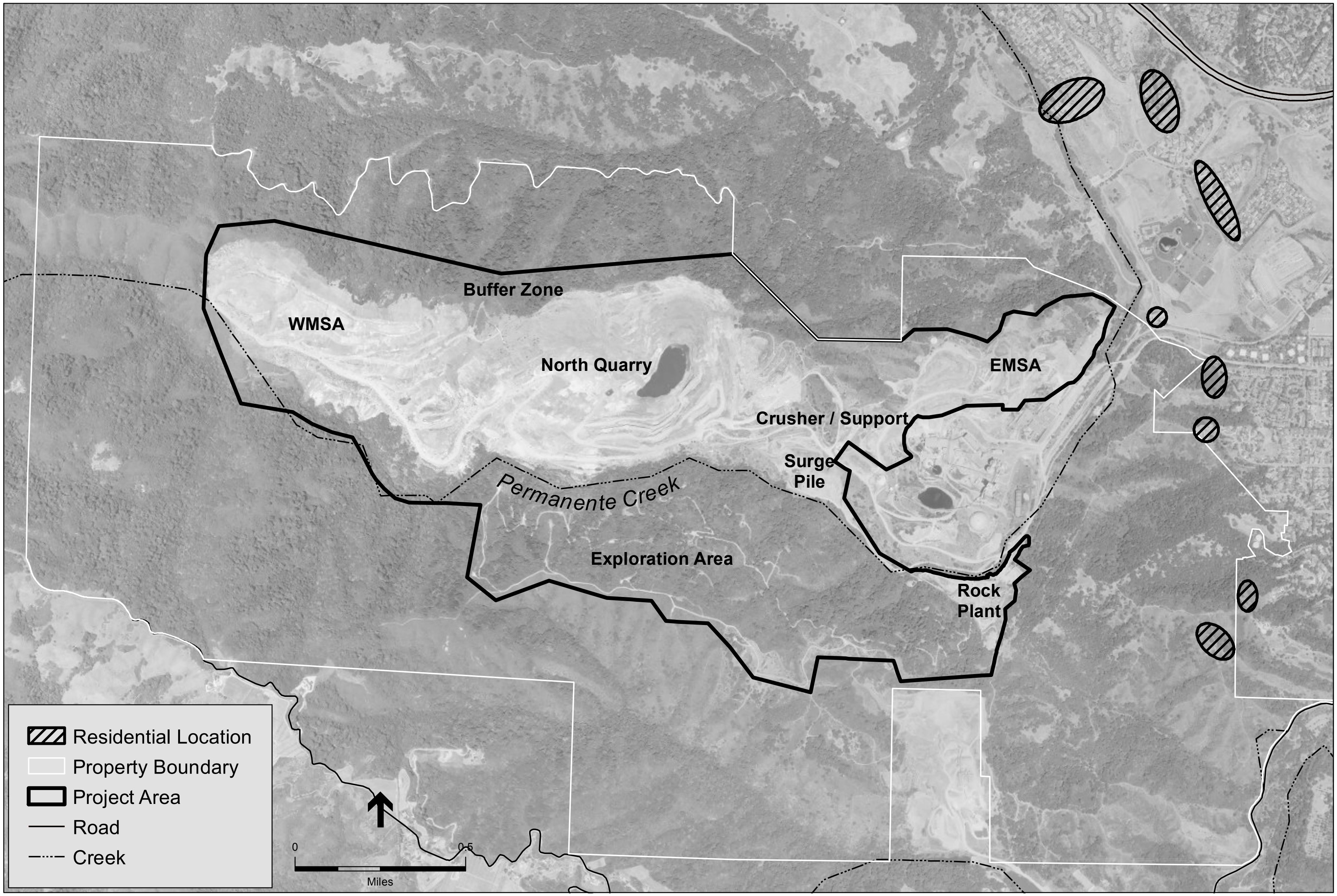
Sensitive Land Uses

Some persons are considered more sensitive than others to air pollutants. The reasons for heightened sensitivity may include age, health problems, proximity to the emissions source, and duration of exposure to air pollutants. Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution, because vigorous exercise associated with recreation places a high demand on the human respiratory system.

Sensitive land uses in the immediate vicinity of the Project are residential dwellings. The closest residence is a caretaker's residence, associated with the Historical Society, located approximately 700 feet east of the East Materials Storage Area (EMSA), on the north side of Permanente Road. The next closest residences are approximately 2,000 feet to the east, south of Permanente Road. Sensitive land uses close to the Project Area are shown in **Figure 4.3-1**.

4.3.1.2 Regulatory Setting

Established federal, state, and regional regulations provide the framework for analyzing and controlling air pollutant emissions and thus general air quality. The U.S. EPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal ambient air quality standards and judging the adequacy of State Implementation Plans (SIPs), described further below. However, the U.S. EPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure



SOURCE: SOURCE: Lehigh, 2011; ESRI, 2011

Lehigh Permanente Quarry Reclamation Plan Amendment . 211742

Figure 4.3-1
Residential Receptor Locations

that the programs continue to be implemented. In California, the CARB is responsible for establishing and reviewing the state ambient air quality standards, developing and managing the California SIP, securing approval of this plan from the U.S. EPA, and identifying TACs. CARB also regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. An air quality management district is primarily responsible for regulating stationary emissions sources at facilities within its geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and 1988 California Clean Air Act. The BAAQMD is the regional agency with regulatory authority over emission sources in the nine county San Francisco Bay Area.

The regulatory settings for the following classes of air pollutants: criteria pollutants, odiferous compounds, and TACs are discussed below.

Regulatory Setting for Criteria Pollutants

As required by the federal Clean Air Act passed in 1970, the U.S. EPA has identified six criteria air pollutants that are pervasive in urban environments and for which state and national health-based ambient air quality standards have been established. EPA calls these pollutants criteria air pollutants because the agency has regulated them by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. Ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead are the six criteria air pollutants.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving volatile organic compounds (VOCs, also called reactive organic gases (ROG)), such as xylene, and nitrogen oxides (NO_x), such as nitric oxide. ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone. Ground level ozone in conjunction with suspended particulate matter in the atmosphere leads to hazy conditions generally termed as "smog."

Nitrogen Dioxide

Nitrogen dioxide is an air quality concern because it acts as a respiratory irritant and is a precursor of ozone. Nitrogen dioxide is produced by fuel combustion in motor vehicles, industrial stationary sources (such as oil refineries), ships, aircraft, and rail transit.

Sulfur Dioxide

Sulfur dioxide is a combustion product of sulfur or sulfur-containing fuels such as coal and oil, which are restricted in the Bay Area. Its health effects include breathing problems and may cause permanent damage to lungs. Sulfur dioxide is an ingredient in acid rain (acid aerosols), which can damage trees, lakes and property. Acid aerosols can also reduce visibility.

Particulate Matter

PM10 and PM2.5 consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. A micron is one-millionth of a meter, or less than one-25,000th of an inch. For comparison, human hair is 50 microns or larger in diameter. PM10 and PM2.5 represent particulate matter of sizes that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of aerosol-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles (PM2.5) of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM10 and PM2.5, are a health concern particularly at levels above the federal and state ambient air quality standards. PM2.5 (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM10 and PM2.5 because their immune and respiratory systems are still developing.

Mortality studies conducted since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope 2006). The CARB has estimated that achieving the ambient air quality standards for PM10 could reduce premature mortality rates by 6,500 cases per year (CARB, 2002).

Lead

Leaded gasoline (currently phased out), paint (houses, cars), smelters (metal refineries), manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects; children are at special risk. Some lead-containing chemicals cause cancer in animals.

Carbon Monoxide

Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

CO concentrations have declined dramatically in California due to existing controls and programs and most areas of the state, including the Project region, have no problem meeting the CO state and federal standards. CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, fewer emissions from new vehicles and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the CARB *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas* (CARB, 2004), shown below:

> The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board (CARB or Board) requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the State designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard.

Ambient Air Quality Standards

Regulation of criteria air pollutants is achieved through both national and state ambient air quality standards and emissions limits for individual sources. Regulations implementing the federal Clean Air Act and its subsequent amendments established national ambient air quality standards (national standards) for the six criteria pollutants. California has adopted more stringent state ambient air quality standards for most of the criteria air pollutants. In addition, California has established state ambient air quality standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Because of the meteorological conditions in the state, there is considerable difference between state and federal standards in California, as shown in **Table 4.3-2**. The table also summarizes the related health effects and principal sources for each pollutant.

The ambient air quality standards are intended to protect the public health and welfare, and they incorporate an adequate margin of safety. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, elderly, people weak from other illness or disease, or persons engaged in strenuous

TABLE 4.3-2
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Bay Area Attainment Status for California Standard	Federal Primary Standard	Bay Area Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	Non-Attainment	0.075 ppm	Non-Attainment	Formed when ROG and NO_x react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1 hour	0.090 ppm	Non-Attainment	---	---	
Carbon Monoxide	8 hour	9.0 ppm	Attainment	9 ppm	Attainment	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	Attainment	35 ppm	Attainment	
Nitrogen Dioxide	Annual Average	0.030 ppm	---	0.053 ppm	Attainment	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
	1 Hour	0.18 ppm	Attainment	0.100 ppm	Unclassified	
Sulfur Dioxide	Annual Average	---	---	0.03 ppm	Attainment	Fuel combustion, chemical plants, sulfur recovery plants and metal processing
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment	
	1 Hour	0.25 ppm	Attainment	0.075 ppm	Attainment	
Respirable Particulate Matter (PM10)	Annual Arithmetic Mean	20 $\mu g/m^3$	Non-Attainment	---	---	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 $\mu g/m^3$	Non-Attainment	150 $\mu g/m^3$	Unclassified	
Fine Particulate Matter (PM2.5)	Annual Arithmetic Mean	12 $\mu g/m^3$	Non-Attainment	15 $\mu g/m^3$	Attainment	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also, formed from photochemical reactions of other pollutants, including NO_x, sulfur oxides, and organics.
	24 hour	---	---	35 $\mu g/m^3$	Non-Attainment	
Lead	Calendar Quarter	---	---	1.5 $\mu g/m^3$	Attainment	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	30 Day Average	1.5 $\mu g/m^3$	Attainment	---	---	
	3-month Rolling Average	---	---	0.15 $\mu g/m^3$	Unclassified	
Hydrogen Sulfide	1 hour	0.03 ppm	Unclassified	No Federal Standard	---	Geothermal Power Plants, Petroleum Production and refining
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	Unclassified	No Federal Standard	---	See PM2.5.

ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

SOURCE: BAAQMD, 2011b; CARB, 2009

work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

Attainment Status

Under amendments to the federal Clean Air Act, U.S. EPA has classified air basins or portions thereof, as either "attainment" or "non-attainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act, which is patterned after the federal Clean Air Act, also requires areas to be designated as "attainment" or "non-attainment" for the state standards. Thus, areas in California have two sets of attainment / non-attainment designations: one set with respect to the national standards and one set with respect to the state standards.

Table 4.3-2 shows the attainment status of the Bay Area with respect to the national and state ambient air quality standards for different criteria pollutants.

Air Quality Plans

The 1977 Clean Air Act amendments require that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. The California Clean Air Act also requires development of air quality plans and strategies to meet state air quality standards in areas designated as non-attainment (with the exception of areas designated as non-attainment for the state PM standards). Maintenance plans are required for attainment areas that had previously been designated non-attainment in order to ensure continued attainment of the standards. Air quality plans developed to meet federal requirements are referred to as State Implementation Plans.

For state air quality planning purposes, the Bay Area is classified as a serious non-attainment area for the 1-hour ozone standard. The "serious" classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the Bay Area update the Clean Air Plan every three years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The Bay Area's record of progress in implementing previous measures must also be reviewed. Bay Area plans are prepared with the cooperation of the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). On September 15, 2010, the BAAQMD adopted the most recent revision to the Clean Air Plan - the *Bay Area 2010 Clean Air Plan* (BAAQMD, 2010b). The *Bay Area 2010 Clean Air Plan* serves to:

- Update the *Bay Area 2005 Ozone Strategy* in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone;
- Consider the impacts of ozone control measures on particulate matter, air toxics, and greenhouse gases in a single, integrated plan;
- Review progress in improving air quality in recent years; and

- Establish emission control measures to be adopted or implemented in the 2010 – 2012 timeframe.

Bay Area Air Quality Management District Rules and Regulations

The BAAQMD is the regional agency responsible for rulemaking, permitting, and enforcement activities affecting stationary sources in the Bay Area. Specific rules and regulations adopted by the BAAQMD limit the emissions that can be generated by various activities, and identify specific pollution reduction measures that must be implemented in association with various activities. These rules regulate not only emissions of the six criteria air pollutants, but also toxic emissions and acutely hazardous non-radioactive materials emissions.

Emissions sources subject to these rules are regulated through the BAAQMD's permitting process and standards of operation. Through this permitting process, including an annual permit review, the BAAQMD monitors generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of a project would be subject to the BAAQMD *Rules and Regulations*. Both federal and state ozone plans rely upon stationary source control measures set forth in BAAQMD's *Rules and Regulations.*

Regulatory Setting for Odors and Nuisances

Though offensive odors from stationary sources rarely cause any physical harm, they remain unpleasant and can lead to public distress generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors. The BAAQMD's CEQA Guidelines recommends that odor impacts be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the odor source will mitigate odor impacts.

Regulatory Setting for Toxic Air Contaminants (TACs)

TACs are regulated under both state and federal laws. Federal laws use the term "Hazardous Air Pollutants" (HAPs) to refer to the same types of compounds that are referred to as TACs under state law. Both terms encompass essentially the same compounds. Under the 1990 Clean Air Act Amendments, 189 substances are regulated as HAPs.

With respect to state law, in 1983 the California legislature adopted Assembly Bill 1807 (AB 1807), which establishes a process for identifying TACs and provides the authority for developing retrofit air toxics control measures on a statewide basis. Air toxics in California also may be regulated because of another state law, the Air Toxics "Hot Spots" Information and Assessment Act of 1987, or Assembly Bill 2588 (AB 2588). Under AB 2588, TACs from individual facilities must be quantified and reported to the local air pollution control agency. The facilities then are prioritized by the local agencies based on the quantity and toxicity of these emissions, and on their proximity to areas where the public may be exposed. In establishing priorities, the air districts are to consider the potency, toxicity, quantity, and volume of hazardous materials released from the facility, the proximity of the facility to potential receptors, and any other factors that the air district determines may indicate that the facility may pose a significant risk. High priority facilities are required to perform a Health Risk Screening Assessment (HRSA), and, if specific risk thresholds are exceeded, they are required to communicate the results to the public in the form of notices and public meetings. Depending on the health risk levels, emitting facilities can be required to implement varying levels of risk reduction measures. CARB identified approximately 200 TACs, including the 189 federal HAPs, under AB 2588.

BAAQMD is responsible for administering federal and state regulations related to TACs. Under federal law, these regulations include National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technology (MACT) for affected sources. BAAQMD also administers the state regulations AB1807 and AB2588 which were discussed above. In addition, the agency requires that new or modified facilities that emit TACs perform air toxics screening analyses as part of the permit application. TAC emissions from new and modified sources are limited through the air toxics new source review program, which superseded the BAAQMD Risk Management Policy, in BAAQMD Regulation 2, Rule 5 for New Source Review of Toxic Air Contaminants. Sources must use the Best Available Control Technology for Toxics (T-BACT) if an individual source cancer risk of greater than 1 in a million, or a chronic hazard index greater than 0.20, is identified in health risk modeling.

Specific TAC regulations and considerations that apply to the Project are described below.

Diesel Exhaust Control Program

In August of 1998, the CARB identified particulate emissions from diesel-fueled engines [diesel particulate matter (DPM)] as TACs. CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* and the *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* (CARB, 2000). The CARB goal is to reduce DPM emissions and the associated health risk by 75 percent in 2010 and by 85 percent in 2020.

Also in 2000, the EPA promulgated regulations (U.S. EPA, 2001) requiring that the sulfur content in motor on-road vehicle diesel fuel be reduced to less than 15 ppm as of June 1, 2006. The EPA also finalized a comprehensive national emissions control program, the 2007 Heavy-duty Highway Diesel Program (also known as the HD 2007 Program), which regulates highway heavy-duty vehicles and diesel fuel as a single system. Under the HD 2007 program, the EPA established new emission standards that would significantly reduce PM and NO_x from highway heavy-duty vehicles by the time the current heavy-duty vehicle fleet has been completely replaced in 2030.

The EPA also promulgated new emission standards for nonroad diesel engines and sulfur reductions in nonroad diesel fuel that would dramatically reduce emissions attributed to nonroad diesel engines. Similar standards have been established by CARB, although more stringent. This affects emissions from construction equipment, locomotives, and marine diesels. The general objective is to reduce DPM emissions to levels of below 0.01 grams per brake horsepower-hour (g/bhp-hr) beginning with 2007 model year engines.

Asbestos Air Toxic Control Measure

In 2002, CARB adopted a new Asbestos Airborne Toxic Control Measure for construction, grading, quarrying and surface mining operations. New emission control measures, such as dust suppressants apply to activities such as road construction and road maintenance, construction, grading, and quarrying and surface mining operations in areas with naturally-occurring asbestos/ serpentine rock. The potential for naturally-occurring asbestos to be present in minerals in the Project Area is discussed in Section 4.7, *Geology, Soils, and Seismicity*. As noted in that section, asbestos has not been detected in numerous samples representative of the onsite geologic materials found at the Permanente Quarry. Accordingly, asbestos is not considered further in this EIR.

Silica Crystalline Dust

In 2005, OEHHA added a chronic reference exposure level (REL) for crystalline silica. Silica is a hazardous substance when it is inhaled, and the airborne dust particles that are formed when the material containing the silica is broken, crushed, or sawn pose potential risks. The potential for crystalline silica to occur in minerals in the Project Area is discussed in the Geology and Soils section, and potential health risks associated with crystalline silica exposure are discussed below.

Local Regulatory Setting

Santa Clara County General Plan

The Health and Safety Chapter of the *Santa Clara County General Plan, 1995-2010* (Santa Clara County, 1994) contains the following air quality policies that would apply to the Project:

> ***Policy C-HS 1*:** Ambient air quality for Santa Clara County should comply with standards set by state and federal law.
>
> ***Policy C-HS 2*:** The strategies for maintaining and improving air quality on a countywide basis, in addition to ongoing stationary source regulation, should include:
>
> a) augmented growth management, land use, and development policies that help achieve air quality standards;
>
> b) transit systems that provide feasible travel options;
>
> c) increased travel demand management and traffic congestion relief; and
>
> d) particulate and small scale emission controls.
>
> ***Policy C-HS 3*:** Countywide or multi-jurisdictional planning by the cities and County should promote efforts to improve air quality and maximize the effectiveness of implementation efforts. Guidance and assistance from the BAAQMD shall be sought in the preparation of coordinated, multi-jurisdictional plans as well as in environmental review of projects that have potential for regionally significant air quality impacts.
>
> ***Policy C-HS 4*:** Future growth and development countywide should be managed and accommodated in such a way that it:
>
> a) minimizes the cumulative impacts on local, regional, and trans-regional air quality; and

b) reduces the general population exposure to levels prescribed by state and/or federal law for urban areas designated as non-attainment areas.

***Policy C-HS 8*:** Employer-based measures for transportation demand management (TDM) should be instituted to the maximum extent possible for large employers in both public and private sectors to encourage ridesharing and increase average vehicle occupancy rates, reduce peak hour congestion, and facilitate use of transit.

***Policy C-HS 9*:** Employer-based ridesharing and TDM should be encouraged as mitigation for traffic generating impacts of new development.

***Policy C-HS 12*:** Measures to reduce particulate matter pollution originating from quarrying, road and building construction, industrial processes, unpaved parking lots, and other sources should be encouraged.

4.3.2 Baseline

The overall baseline for this EIR reflects the physical environmental conditions in the vicinity of the Project as they existed on June 29, 2007, when the County published a NOP in connection with the Applicant's first proposed amendment of the 1985 Reclamation Plan. Pertinent to the air quality analysis, documentation establishes that, by 2007, some materials storage already had occurred in the EMSA.

With regard to air emissions, the proposed Project involves an existing quarry operation. Such operations are characterized by fluctuating production and associated air emissions, in response to continually changing market demands. An emission inventory that considers only conditions existing in June 2007 (or any other specific point in time) may substantially over- or under-represent typical conditions. Accordingly, baseline air emissions for this air quality assessment are based on an average over the 11-year period from January 1, 2000 to December 31, 2010, which includes periods of relatively high production as well as relatively low production at the Permanente Quarry in response to changing market demands. The following operations and activities are included in the baseline emissions estimates:

- Quarry operations
- Waste rock (overburden) handling
- Associated mobile sources and portable equipment

Emissions associated with operation of the adjacent cement plant are not included in the baseline analysis since the cement plant is a separately-permitted industrial use, and because the Project would not affect the cement plant's use permit, operating permits, or regulatory status. Emissions from the cement plant have been quantified by Lehigh as part of the BAAQMD's Title V Operating Permit renewal process, and are reported to the BAAQMD.

Although operation of the primary and secondary crushers and the rock plant would be ongoing during the Project, the particulate matter emissions from those sources were not included in either the baseline or Project emission calculations (ALG, 2011a). The reasoning for this is that the rock plant and crusher would be subject to controls under the Project that would reduce particulate emissions in comparison to the baseline.[1] Since this air quality analysis is based on the net change in emissions compared to baseline, excluding those sources simply eliminates from consideration a decrease in particulate emissions.

4.3.3 Significance Criteria

Consistent with County of Santa Clara Environmental Checklist and Appendix G of the CEQA Guidelines, the Project would have a significant impact on air quality if it would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

c) Result in a cumulatively considerable net increase of any nonattainment pollutant (including releasing emissions that exceed quantitative thresholds for ozone precursors);

d) Expose sensitive receptors to substantial pollutant concentrations; or

e) Create objectionable odors affecting a substantial number of people.

4.3.3.1 Criteria Pollutants

Updated BAAQMD *CEQA Air Quality Guidelines* (BAAQMD, 2011a) establish the following quantitative and qualitative thresholds of significance for criteria pollutant emissions:

- Result in total construction emissions of ROG, NO_x, or PM2.5 (exhaust) of 10 tons per year or greater, or 54 pounds per day or greater.
- Exceed a construction emission threshold for PM10 (exhaust) of 15 tons per year or greater, or 82 pounds per day or greater.
- For PM10 and PM2.5 as part of fugitive dust generated during construction, the BAAQMD Guidelines specify compliance with Best Management Practices as the threshold.
- Result in total operational emissions of ROG, NO_x, or PM2.5 of 10 tons per year or greater, or 54 pounds per day or greater.
- Exceed an operational emission threshold for PM10 of 15 tons per year or greater, or 82 pounds per day.
- Result in CO concentrations of 9.0 ppm (8-hour average) and 20.0 ppm (1-hour average).

According to the BAAQMD *CEQA Air Quality Guidelines*, a project's contribution to cumulative impacts for criteria pollutants should be considered significant if the project's impact individually would be significant (i.e., exceeds the BAAQMD's quantitative thresholds).

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1 Project controls include replacement of the primary crusher (90% reduction), and implementation of the facility's Fugitive Dust Control Plan submitted to the BAAQMD in September 2010 and revised January 2011 (50% reduction in stockpile wind erosion emissions and 75% reduction in unpaved road wind erosion/dust entrainment emissions).

4.3.3.2 Odors

For odors, the operational threshold is based on complaint history, whereby five complaints per year averaged over three years would be considered significant.

4.3.3.3 Health Risks and Hazards

The operation of any project with the potential to expose sensitive receptors to substantial levels of TACs (such as DPM) would be deemed to have a potentially significant impact. More specifically, proposed projects that have the potential to expose the public to TACs in excess of the following BAAQMD CEQA thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million people for 70 year exposure.
- Ground-level concentrations of non-carcinogenic TACs would exceed a Hazard Index greater than 1 for the MEI.
- Result in an incremental increase in localized annual average concentrations of PM2.5 exceeding 0.3 micrograms per cubic meter from either project construction or operations.

Under the BAAQMD *CEQA Air Quality Guidelines*, the Project would result in a significant TAC cumulative impact to air quality if it would:

- Result in potential to expose persons to substantial levels of TACs, such that the probability of contracting cancer for the MEI considering all existing sources within 1,000 feet of the Project fence line and proposed Project sources exceeds 100 in one million; or
- Result in an incremental increase in localized annual average concentrations of PM2.5 exceeding 0.8 micrograms per cubic meter considering all existing sources within 1,000 feet of the Project fence line and proposed Project sources.

4.3.4 Discussion of Criteria with No Air Quality Impacts

The Project does not have the potential to cause a significant impact in the following areas:

a) The Project would not conflict with or obstruct implementation of the applicable air quality plan.

The most recently adopted air quality plan for the Bay Area is the 2010 CAP. The 2010 CAP is an update to the BAAQMD's 2005 Ozone Strategy to comply with State air quality planning requirements. The 2010 CAP also serves as a multi-pollutant air quality plan to protect public health and the climate. The 2010 CAP control strategy includes revised, updated, and new measures in the three traditional control measure categories: stationary sources measures, mobile source measures, and transportation control measures. In addition, the 2010 CAP identifies two new categories of control measures, including land use and local impact measures and energy and climate measures.

BAAQMD recommends that the agency approving a project where an air quality plan consistency determination is required analyze the project with respect to the following questions: 1) does the project support the primary goals of the air quality plan; 2) does the project include applicable control measures from the air quality plan; and 3) does the project disrupt or hinder implementation of any 2010 CAP control measures? If the answer to questions 1 and 2 is yes and the answer to question 3 is no, then the BAAQMD considers the project consistent with air quality plans prepared for the Bay Area. Any project that would not support the 2010 CAP goals would not be considered consistent with the 2010 CAP. The recommended measure for determining project support of these goals is consistency with BAAQMD CEQA thresholds of significance. As presented in the subsequent impact discussions, the Project would not exceed the BAAQMD significance thresholds; therefore, the Project would support the primary goals of the 2010 CAP.

Projects that incorporate all feasible air quality plan control measures are considered consistent with the 2010 CAP. One 2010 CAP control measure, MSM C-1, would be applicable to the Project. The intent of MSM C-1 is to reduce diesel particulate emissions from construction equipment through either installation of filters or upgrading to cleaner-burning engines. The Project would be consistent with this measure because the Applicant will be required to comply with phase in of the CARB In-Use Off-Road Diesel Vehicle Regulation (CARB, 2011b).

In summary, with regard to criteria air pollutants and toxic air contaminants, the Project would support the primary goals of the 2010 CAP, it would include all applicable 2010 CAP control measures, and it would not disrupt or hinder implementation of any 2010 CAP control measures. Therefore, the Project would not conflict with or obstruct implementation of with the 2010 CAP. See Section 4.8, *Greenhouse Gas Emissions*, for a discussion of Project consistency with those aspects of the 2010 CAP.

e) The Project would not create objectionable odors affecting a substantial number of people.

Land uses that typically pose potential odor problems include agriculture, wastewater treatment plants, food processing and rendering facilities, chemical plants, composting facilities, landfills, waste transfer stations, and dairies. The Project does not include any of these land uses or similar land uses. In addition, the Permanente Quarry is currently operating, and the Project would not result in any new odor sources. Therefore, the Project would not create objectionable odors that would affect a substantial number of people.

4.3.5 Impacts and Mitigation Measures

4.3.5.1 Criteria Air Pollutants

The assessment for criteria air pollutants is based on the ALG report *Air Quality Technical Analysis – Revised Reclamation Plan Amendment* (ALG, 2011a; included in this EIR as **Appendix D**). The ALG report identified and quantified the emission sources of criteria air pollutants, TACs, and greenhouse gases (GHGs)[2] from existing operations and from the proposed Project. Emission calculations in the ALG report are based on specific equipment and material throughput data provided by the Applicant, as well as emission factors from the following sources:

2 GHGs are addressed in Section 4.8, *Greenhouse Gas Emissions*.

- *AP-42 Compilation of Air Pollutant Emission Factors, Fifth Edition* (U.S. EPA, 1995);
- *Emissions Inventory Guidance – Mineral Handling and Processing Industries* (Mojave Desert Air Quality Management District, 2000);
- CARB's OFFROAD2007 model for off-road vehicles and equipment; and
- CARB's EMFAC2007 model for on-road vehicles.

The assumptions, emission factors, calculations, and other data in the ALG report were independently reviewed by the EIR authors and were determined to be acceptable for incorporation in this analysis.

This analysis is based on the net change in emissions from the Project compared to baseline. As described above in Section 4.3.2, *Baseline*, baseline air emissions for this air quality assessment are determined from an average over the 11-year period from January 1, 2000 to December 31, 2010, which includes periods of relatively high production as well as relatively low production at the Permanente Quarry in response to changing market demands. Project emissions are calculated from the proposed operation and reclamation activities at the Quarry. The net change in emissions from the Project compared to baseline is then compared to the CEQA significance thresholds adopted by the BAAQMD.

Impact 4.3-1: The Project would generate emissions of criteria air pollutants which could contribute to existing nonattainment conditions and further degrade air quality. *(Less than Significant Impact)*

As described in Chapter 2, *Project Description*, the Project includes areas that have been disturbed by prior mining operations, areas that will be disturbed by mining operations within the next 20 years, open space areas that serve to physically separate operations at the Quarry from other uses in the surrounding environs (and additional areas that would be for this purpose), and areas that have been partially disturbed by prior exploratory and/or mining activities. The primary areas to be reclaimed include the existing Quarry pit, two overburden disposal areas referred to as the West Materials Storage Area (WMSA) and the East Materials Storage Area (EMSA), the crusher/Quarry office area, surge pile, rock plant, an area south of Permanente Creek that has been subject to mining operation-related exploratory activities, and seven areas along Permanente Creek known as the Permanente Creek Reclamation Areas (PCRA). General emission sources and activities in the baseline include:

- Quarry Operations (drilling of charge holes; blasting; bulldozing, scraping and grading of overburden, waste material, and limestone; material handling; dust entrainment; wind erosion associated with actively disturbed unpaved areas)
- Waste Rock (overburden) Handling (material handling; bulldozing, scraping and grading of material; dust entrainment; wind erosion)
- Fuel Storage and Dispensing (operation of diesel and gasoline storage tanks)

- Combustion Sources (portable internal combustion engines; off-road diesel equipment; on-site work trucks; off-site fuel transport trucks and employee commute vehicles)

During Phase 1 of the Project, the Quarry-related operations listed above would continue to occur. In addition, emission sources and activities specific to the Project would include:

- Reclamation Activities, which encompass reclamation (including contouring, capping, and revegetating) of the Quarry pit, overburden storage and infill areas, and other disturbed areas as identified in the Project.

The following emission reduction measures have been committed to by the Applicant as part of the Project, and are included in the calculation of Project emissions:

- Water unpaved roads;

- Water active areas consistent with a dust mitigation plan submitted to the BAAQMD in 2010;

- Use an Overland Conveyor System, powered by electric motors, to move 75 percent of the waste rock from the WMSA to reclaim the Quarry pit; and

- Water conveyor transfer points and screens associated with the proposed Overland Conveyor System.

Project emissions were calculated for Phases 1 and 2 of the Project. (This analysis does not quantify emissions associated with Phase 3 of the Project because material handling, extent of dust entrainment and wind erosion, off-road vehicle usage, and related activities would be substantially lower in Phase 3 than in Phase 1 or 2.) The net change in emissions was then calculated by comparing the highest Project emissions for each pollutant for each averaging period with the average emissions calculated for the baseline period. With the exception of annual and daily particulate matter (PM10 and PM2.5) emissions, all other criteria pollutant emissions would be highest during Phase 1 of the Project, during which emissions associated with ongoing mining operations would also occur. Annual and daily PM10 and PM2.5 emissions would be highest during Phase 2 of the Project.

The BAAQMD has adopted mass significance thresholds for operations-related emissions in its *CEQA Air Quality Guidelines*. These thresholds are 10 tons per year or 54 pounds per day of ROG, NO_x, or PM2.5 and 15 tons per year or 82 pounds per day for PM10. Baseline and maximum daily Project emissions are summarized in **Table 4.3-3**, and the net change is compared to the BAAQMD daily thresholds. **Table 4.3-4** summarizes the baseline and maximum annual Project emissions and compares the net change to the BAAQMD annual thresholds.

As can be seen from the data in Tables 4.3-3 and 4.3-4, the Project would result in net emissions reductions for all nonattainment air pollutants (PM10, PM2.5, and the ozone precursors NO_x and ROG), and therefore would not exceed the BAAQMD daily or annual thresholds of significance. This would be a less than significant impact.

TABLE 4.3-3
MAXIMUM DAILY CRITERIA AIR POLLUTANT EMISSIONS
(pounds/day)[a]

Scenario	PM10	PM2.5	NO_x	ROG	CO	SO_2
Baseline Emissions	5,411	893	2,440	167	2,641	27
Project Emissions	1,970	311	2,124	123	1,891	32
Maximum Daily Incremental Change[b]	(3,441)	(582)	(316)	(44)	(750)	5
BAAQMD Threshold	82	54	54	54	None	None
Significant Impact (Yes or No)?	No	No	No	No	--[c]	--[d]

a Emissions are based on the *Air Quality Technical Analysis – Revised Reclamation Plan Amendment* (ALG, 2011a) and include watering unpaved roads control for the Baseline scenario and the controls listed above for the Project scenario. Specific assumptions and emission factors incorporated into the calculations are included in Appendix D.
b Values in (parentheses) are net reductions for Project minus Baseline emissions.
c See Impact 4.3-2 for a discussion of CO significance.
d The Bay Area is in attainment for SO_2, so a CEQA threshold of significance has not been established by the BAAQMD.

SOURCE: ALG, 2011a

TABLE 4.3-4
MAXIMUM ANNUAL CRITERIA AIR POLLUTANT EMISSIONS
(tons/year)[a]

Scenario	PM10	PM2.5	NO_x	ROG	CO	SO_2
Baseline Emissions	754	122	324	24	288	1
Project Emissions	291	45	301	18	222	3
Maximum Annual Incremental Change[b]	(463)	(77)	(23)	(6)	(66)	2
BAAQMD Threshold	15	10	10	10	None	None
Significant Impact (Yes or No)?	No	No	No	No	--[c]	--[d]

a Emissions are based on the *Air Quality Technical Analysis – Revised Reclamation Plan Amendment* (ALG, 2011a) and include watering unpaved roads control for the Baseline scenario and the controls listed above for the Project scenario. Specific assumptions and emission factors incorporated into the calculations are included in Appendix D.
b Values in (parentheses) are net reductions for Project minus Baseline emissions.
c See Impact 4.3-2 for a discussion of CO significance.
d The Bay Area is in attainment for SO_2, so a CEQA threshold of significance has not been established by the BAAQMD.

SOURCE: ALG, 2011a

SO_2 emissions are not considered a problem in the Bay Area as the region is in attainment of the state and national air quality standards. Nonetheless, the net increase in SO_2 emissions of 5 pounds/day and 2 tons/year from the Project would be inconsequential and would not substantially degrade air quality, so the impact would be less than significant.

The significance of CO emissions from the Project is addressed in Impact 4.3-2, below.

Impact 4.3-2: Project traffic associated with operational and reclamation activities would generate localized CO emissions on roadways and at intersections in the Project vicinity. *(Less than Significant Impact)*

According to the BAAQMD *CEQA Air Quality Guidelines*, a project would result in a less-than-significant impact to localized CO concentrations if the following screening criteria are met:

1. Project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.
2. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
3. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The Project would not exceed the standards included in the Santa Clara County Congestion Management Plan established by the Santa Clara Valley Transportation Authority (SCVTA). In regards to the second and third criteria, intersection traffic volumes (including minimal external Project traffic) would be substantially less than 44,000 and 24,000 vehicles per hour, respectively. The estimated increase in traffic volumes caused by reclamation-related traffic (a maximum of approximately six round trips per day) would not be substantial relative to background traffic conditions, nor would Project traffic significantly disrupt daily traffic flow on area roadways (see Section 4.17, *Transportation/Traffic*).

Based on the BAAQMD's criteria, Project-related traffic would not lead to violations of the carbon monoxide standards and therefore, no further analysis was required for carbon monoxide impacts of the Project and the impact is less than significant.

4.3.5.2 Toxic Air Contaminants (Health Risk)

A health risk assessment (HRA) is an analysis designed to predict the generation and dispersion of air toxics in the outdoor environment, evaluate the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure. An HRA was conducted to evaluate the cancer risks and non-cancer health effects associated with exposure to toxic air contaminants (TACs) emitted as a result of the Project. Cancer risks[3] are evaluated based on assumed lifetime exposure to TACs

[3] Cancer risk is defined as the lifetime probability of developing cancer from exposure to carcinogenic substances. Cancer risks are expressed as the chances in one million of contracting cancer, for example, 10 cancer cases among one million people exposed.

over the expected lifespan of the Project. Non-cancer health risks[4] evaluated include adverse health effects from both acute (highest 1-hour exposure) and chronic (average annual exposure). As required by BAAQMD, an analysis of PM2.5 concentrations was also conducted. The assessment methods are designed to estimate the highest possible, or "upper bound" risks to the most sensitive members of the population (i.e., children, elderly, infirm), as well as those that are potentially exposed to TACs on a routine and prolonged basis (i.e., residents, recreational area users). Air toxics associated with the Project include various metals within fugitive dust (such as mercury and chromium), crystalline silica, and DPM.

This HRA was conducted in accordance with technical guidelines developed by federal, state, and regional agencies, including US EPA, CalEPA, OEHHA *Air Toxics Hot Spots Program Guidance* (OEHHA, 2003), and the BAAQMD's *Health Risk Screening Analysis Guidelines* (BAAQMD, 2005). The HRA is based on estimated emissions of a wide variety of TACs from the Project, and the length of time those living, working, and recreating in the vicinity of the Project could be exposed to TAC emissions. Actual exposures are not measured, but rather are modeled using software that uses local meteorology and topography to predict the dispersion of TACs from their source and the resulting concentrations at receptor sites. The models tend to be conservative, both in terms of the estimated exposure and the toxic effects of the substances to which people are exposed; that is, the models tend to overestimate the adverse health impacts.

This HRA is an incremental health assessment in that it examines the increase or decrease in adverse health impacts associated with the Project as compared to the conditions that would exist without the Project (i.e., the No Project Alternative). That is, the Project-related incremental health impacts are calculated as the health impacts associated with implementation of the Project minus the health impacts which would occur without the Project. Use of the No Project Alternative is an appropriate foundation for the HRA analysis because it reflects the continuation of baseline conditions, and is thus consistent with CEQA Guidelines section 15126.6(e)(1).

Table 4.3-5 describes the emission scenario examined as the No Project Alternative for the HRA (the No Project Alternative is further described in Section 3.3.1.4, *No Project Alternative*). Under this scenario, quarrying activities have occurred since the baseline date of June 2007 and would continue to occur at the baseline production rate through 2027. Overburden storage at the EMSA is assumed to have occurred from 2008 through 2011. During Phase 1A (a total of 11 years from 2012 through 2022) of the No Project Alternative, Quarry-related operations would occur at the baseline production rate with no overburden storage in EMSA (overburden would instead be placed in the Quarry West Wall). During Phase 1B (a total of 5 years from 2023 through 2027) of the No Project Alternative, Quarry-related operations would continue at the baseline production rate and in addition would include reclamation of the EMSA.EMSA reclamation would be completed in 2027.

4 Non-cancer adverse health risks are measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentrations of the various non-carcinogens from the Project to published reference exposure levels (RELs) that can cause adverse health effects.

TABLE 4.3-5
"NO PROJECT" SCENARIO FOR THE HEALTH RISK ASSESSMENT

Phase	Years	Summary of Activities	Annual Production Rate	DPM Emissions (tons/year)	PM2.5 Emissions (tons/year)
"Existing" *(with EMSA)*	2008-2011	Continued Quarry operations; overburden storage occurs in EMSA and Quarry west wall.	5,607,455 tons	19.0	122
Phase 1A	2012-2022	Continued Quarry operations; no overburden storage in EMSA.	5,607,455 tons	7.0	111
Phase 1B	2023-2027	Continued Quarry operations until completion; EMSA reclamation commences in 2023 and is completed in 2027.	5,607,455 tons	8.1	138
Phase 2	2028-2032	WMSA stockpile is excavated and Quarry pit receives this material as backfill.	9,920,854 tons	5.4	109
Phase 3	2033-2037	Quarry pit backfilling is completed; Rock Plant is dismantled then reclaimed; remaining disturbed areas to enter final reclamation.		1.1	26.6
"No Project" Total ***(total is obtained by multiplying the annual emissions in each Phase by the number of years in that Phase, then summing up)***				226	3,077

SOURCE: ALG, 2011b; EnviroMINE, 2011.

During Phase 2 (a total of 5 years from 2028 through 2032) of the No Project Alternative, the WMSA stockpile would be excavated and the Quarry pit would receive the WMSA material as backfill. During Phase 3 of the No Project (a total of 5 years from 2033 through 2037), Quarry pit backfilling would be completed, the Rock Plant would be dismantled and removed, and the remaining disturbed areas would be reclaimed.

The No Project Alternative would occur from 2008 through 2037; a total of 30 years. The total cumulative DPM and PM2.5 emissions from the No Project Alternative would be 226 and 3,077 tons, respectively.

Table 4.3-6 provides the emission scenario examined as the Project for the HRA. Under these conditions, quarrying activities have occurred since the baseline date of June 2007 and would continue to occur at the baseline production rate through 2011. During Phase 1 (a total of 9 years from 2012 through 2020) of the Project, Quarry-related operations would occur at a higher production rate (ALG, 2011a). The ongoing quarrying operations and the initiation of EMSA reclamation activities were analyzed as two separate periods (Phase 1A and 1B). EMSA reclamation would be completed in 2020.

During Phase 2 (a total of 5 years from 2021 through 2025) of the Project, the WMSA stockpile would be excavated and the Quarry pit would receive the WMSA material as backfill. During Phase 3 of the Project (a total of 5 years from 2026 through 2030), Quarry pit backfilling would be completed, the Rock Plant would be dismantled and removed, and the remaining disturbed areas would be reclaimed.

The Project as proposed would occur from 2008 through 2030; a total of 23 years. The total cumulative DPM and PM2.5 emissions from the Project would be 225 and 1,380 tons, respectively.

Tables 4.3-5 and 4.3-6 also provide the estimated DPM and PM2.5 emissions throughout the phases of the Project. As shown, DPM emissions would decrease with time as more efficient engines replace older equipment and as the production rates and hours of equipment operation decrease. Emissions during Phase 3 would be much lower than Phases 1 or 2 due to the less intensive operations during Phase 3.

PM2.5 emissions for the Project reflect the higher production rate that would occur but also reflect emission controls related to the Applicant’s fugitive dust management planning. Given that the total PM2.5 emissions from the Project would be much lower than for the No Project Alternative, the health impacts related to fugitive dust would also be lower.[5]

5 Project controls include replacement of the primary crusher (90% reduction), and implementation of the facility’s Fugitive Dust Control Plan submitted to the BAAQMD in September 2010 and revised January 2011 (50% reduction in stockpile wind erosion emissions and 75% reduction in unpaved road wind erosion/dust entrainment emissions).

TABLE 4.3-6
"PROJECT" SCENARIO FOR THE HEALTH RISK ASSESSMENT

Phase	Years	Summary of Activities	Annual Production Rate	DPM Emissions (tons/year)	PM2.5 Emissions (tons/year)
"Existing" *(with EMSA)*	2008-2011	Continued Quarry operations; overburden storage occurs in EMSA and Quarry west wall.	5,607,455 tons	19.0	122
Phase 1A	2012-2015	Continued Quarry operations; overburden storage continues in EMSA and Quarry west wall; EMSA storage ends in 2015. PCRA activities occur in 2012.	10,031,085 tons	12.6	43.1
Phase 1B	2016-2020	Continued Quarry operations until completion (within continued overburden storage in EMSA); EMSA reclamation is completed in 2020.	10,031,085 tons	13.7	72.0
Phase 2	2021-2025	WMSA stockpile is excavated and Quarry pit receives this material as backfill. PCRA activities occur in 2025.	9,920,854 tons	5.0	45.4
Phase 3	2026-2030	Quarry pit backfilling is completed; Rock Plant is dismantled then reclaimed; remaining disturbed areas to enter final reclamation.		1.1	26.6
Project Total ***(total is obtained by multiplying the annual emissions in each Phase by the number of years in that Phase, then summing up)***				225	1,380

SOURCE: ALG, 2011a; EnviroMINE, 2011.

DPM emissions for the Project reflect the higher production rate that would occur but also project reflect emission controls related to the Applicant's replacement of older equipment in advance of that required by CARB regulations. The total DPM emission from the Project would be about the same as for the No Project. However, health impacts would not necessarily be expected to be the same because the location (relative to sensitive receptors) in which the emissions occur is as important to the health impacts analysis as the magnitude of the emissions. The Project would involve overburden storage at the EMSA during Phase 1, whereas no additional overburden storage would occur at the EMSA under the No Project Alternative. Thus, the health impacts for receptors near the EMSA are the focus of this HRA.

The HRA is accomplished in four steps: hazards identification, exposure assessment, toxicity assessment, and risk characterization. These steps cover the estimation of air emissions, the estimation of the air concentrations resulting from a dispersion analysis, the incorporation of the toxicity of the pollutants emitted, and the characterization of the risk based on exposure parameters such as breathing rate, age adjustment factor, and exposure duration – each depending on receptor type. **Appendix E** provides the methodology, assumptions, and data used to develop the HRA.

According to CalEPA, an HRA should not be interpreted as the expected rates of cancer or other potential human health effects, but rather as estimates of potential risk or likelihood of adverse effects based on current knowledge, under a number of highly conservative assumptions and the best assessment tools currently available.

Impact 4.3-3: The Project would expose people to increased levels of toxic air contaminants, which could lead to an increase in the risk of cancer. ***(Less than Significant Impact with Mitigation Incorporated)***

Cancer risk is defined as the lifetime probability of developing cancer from exposure to carcinogenic substances. Cancer risks are expressed as the chances in one million of contracting cancer, for example, ten cancer cases among one million people exposed. If the incremental cancer risk exceeds 10 persons per million, the impact is considered to be significant.

Fugitive Dust Emissions from Quarrying/Overburden Operations

Fugitive dust from quarrying (generally within the Quarry pit) operations occurs as a result of drilling, blasting, grading, material handling, and wind erosion from disturbed areas. Fugitive dust from overburden operations (generally within the EMSA and WSMA) occurs from grading, material handling, and wind erosion from disturbed areas. Fugitive dust also occurs as a result of haul truck traffic on unpaved roads. While these emission sources are part of ongoing Quarry operations, they are included in this HRA because they would occur at different rates and at different locations under the Project compared to the No Project Alternative, and thus would contribute to the calculation of the Project's incremental health risk.

Table 4.3-7 shows the estimated cancer risk at the maximum exposed receptors due to fugitive dust from quarrying/overburden operations. As shown in Table 4.3-7, the incremental risk from all carcinogens from fugitive dust emissions at the maximum exposed residence-adult and

TABLE 4.3-7
ESTIMATED CANCER RISK FOR FUGITIVE DUST – QUARRYING/OVERBURDEN OPERATIONS

Pollutant	Residence – Adult (per million)	Residence – Child (per million)	School (per million)
Arsenic	-0.03	-0.03	-0.01
Beryllium	-0.01	-0.01	-0.00
Cadmium	-0.03	-0.04	-0.01
Lead	-0.00	-0.00	-0.00
Nickel	-0.04	-0.05	-0.01
Chromium VI	-0.18	-0.16	-0.07
Total	-0.28	-0.29	-0.11

SOURCE: KB Environmental Sciences, Inc, 2011 (included in this EIR as Appendix E)

residence-child receptors would be a decrease of approximately 0.3 in one million. The maximum exposed residence is the caretaker's residence. The incremental cancer risks due to fugitive dust from quarrying/overburden activities would decrease with implementation of the Project, and thus, would be below the BAAQMD CEQA threshold of 10 in a million. The decrease in cancer risk due to quarrying/overburden operations fugitive dust is due to much lower emissions resulting from project controls related to the Applicant's fugitive dust management planning.

DPM Emissions from Off-road Equipment

Off-road equipment would be used for the quarrying and overburden activities and includes drill rigs, graders, loaders, excavators, loaders, and haul trucks As shown in **Table 4.3-8**, the majority of the incremental cancer risk would be associated with DPM emissions from overburden handling. The total cancer risk from off-road equipment would be 18.4 and 8.6 in one million for a residence-adult and residence-child, respectively. The maximum incremental cancer risk would be 4.5 in one million for a nearby school. The results of the analysis indicate that the maximum concentration would occur at a residence (associated with the Cupertino Historical Society) to the northeast of the site. Impacts would decrease steadily to the east, west, and north of this location. The incremental cancer risks due to off-road equipment would be above the BAAQMD CEQA threshold of 10 in a million for the residence-adult but below the threshold for residence-child and school children.[6]

DPM Emissions from On-road Haul Trucks

On-road haul truck activity included in the HRA analysis consists of trucks hauling material to customers from the rock plant and trucks associated with importing mulched green waste to mix with the WMSA material as it is used to backfill the Quarry pit in Phase 2 (cement plant trucks

6 Cancer risks are a function of exposure duration, exposure frequency, breathing rate, and age sensitivity factors (see Appendix E for details), which are dependent on receptor type (residence-adult, residence-child, or school children). These factors together with the pollutant concentration represent an inhalation dose. Although residence-child (or school children) have higher breathing rates and age sensitivity factors, their exposure duration is much lower; resulting in a lower inhalation dose. Chronic and acute impacts, however, do not factor in exposure duration, exposure frequency, breathing rate, and age sensitivity factors; thus, there is no difference for chronic and acute impacts between a residence-adult and residence-child exposed to the same pollutant concentration.

TABLE 4.3-8
ESTIMATED CANCER RISK DUE TO OFF-ROAD EQUIPMENT

Source	Residence – Adult (per million)	Residence – Child (per million)	School (per million)
Quarry Pit Operations	-2.88	-4.57	2.81
Overburden Operations	21.3	13.2	1.71
Total	**18.4**	**8.61**	**4.52**
Location	**Cupertino Historical Society**	**Cupertino Historical Society**	**Lincoln Elementary School**

are included in the cumulative impact analysis). At the maximum exposed receptor, the incremental residence-adult and residence-child cancer risk would be 0.13 and 0.16 in one million, respectively, for on-road haul truck activities, and thus below the BAAQMD CEQA threshold of 10 in a million. This increase in health risks is a result of a slightly higher number of truck trips (due to higher production rates) with the implementation of the Project compared to the No Project Alternative.

Summary of Cancer Risks

A summary of the incremental cancer risks provides the total health impact from fugitive dust and DPM emissions from all sources associated with the Project. **Table 4.3-9** presents the cancer risks by pollutant type, while **Table 4.3-10** presents the cancer risk by emission source category. The total maximum cancer risks for residence-adult and residence-child would be 18.3 and 8.5 in one million, respectively, and would be mostly due to DPM from off-road equipment. The maximum cancer risk for school children would be 4.4 per million. The total cancer risks would be above the BAAQMD CEQA threshold of 10 in a million for the residence-adult but below the threshold for residence-child and school children.

TABLE 4.3-9
ESTIMATED INCREMENTAL CANCER RISK BY POLLUTANT

Pollutant	Residence – Adult (per million)	Residence – Child (per million)	School (per million)
Arsenic	-0.03	-0.03	-0.01
Beryllium	-0.01	-0.01	0.00
Cadmium	-0.03	-0.04	-0.01
Lead	0.00	-0.00	0.00
Nickel	-0.04	-0.05	-0.01
Chromium VI	-0.18	-0.16	-0.07
DPM	**18.6**	**8.77**	**4.50**
Total	**18.3**	**8.48**	**4.39**
Location	**Cupertino Historical Society**	**Cupertino Historical Society**	**Lincoln Elementary School**

SOURCE: KB Environmental Sciences, Inc, 2011 (included in this EIR as Appendix E)

TABLE 4.3-10
ESTIMATED INCREMENTAL CANCER RISK BY EMISSION SOURCE CATEGORY

Source	Residence – Adult (per million)	Residence – Child (per million)	School (per million)
Quarrying/Overburden/Unpaved Areas	-0.28	-0.29	-0.11
Off-road Equipment	18.4	8.61	4.52
On-road Haul Trucks	0.13	0.16	-0.02
Total	**18.3**	**8.48**	**4.39**
Location	**Cupertino Historical Society**	**Cupertino Historical Society**	**Lincoln Elementary School**

SOURCE: KB Environmental Sciences, Inc, 2011 (included in this EIR as Appendix E)

The incremental cancer risk for the five highest receptors is shown in **Table 4.3-11**. Receptor 1 represents the Cupertino Historical Society caretaker's residence and the other receptors represent the nearest residential areas located near Little Stevens Creek Boulevard to the east of the site. Of note, the Cupertino Historical Society caretaker's residence is the only residence in excess of 10 in a million. Thus, any mitigation measures should focus on emissions associated with activities impacting this location (i.e., activities associated with the EMSA). Throughout the receptor grid, some incremental cancer risks are greater than zero and some are less than zero (i.e., a lower cancer risk as a result of the implementation of the Project). The average incremental cancer risk over the entire receptor grid (a total of 535 receptors) is 1.3 per million.

TABLE 4.3-11
ESTIMATED CANCER RISK AT TOP FIVE RECEPTORS

Receptor ID	Residence – Adult (per million)
1	18.3
176	8.98
145	7.92
177	7.61
146	6.75

SOURCE: KB Environmental Sciences, Inc, 2011 (included in this EIR as Appendix E)

Since the incremental cancer risks at the maximum receptor (the caretaker's residence) would be greater than 10 in one million, the impact is potentially significant without mitigation.

> **Mitigation Measure 4.3-3a:** Within 90 days of Project approval, the Applicant shall submit to the County and the BAAQMD a comprehensive inventory of all Project-related off-road construction equipment expected to be used during any portion of the Project. The inventory shall include the horsepower rating, engine production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory shall be updated and submitted annually throughout the duration of the Project.

Mitigation Measure 4.3-3b: Within 90 days of Project approval, the Applicant shall provide a plan for approval by the County and the BAAQMD demonstrating that Project-related off-road equipment would achieve a Project (EMSA-specific) wide fleet-average 35 percent reduction in DPM emissions compared to the proposed fleet in the ALG report (ALG, 2011a) during Phase 1 of the Project. The plan shall be updated and submitted annually throughout the duration of the Project. Options for reducing emissions may include, but are not limited to:

- Using newer model engines (e.g., engines that meet U.S. EPA interim/final Tier 4 engine standards);
- Use of Retrofit Emission Control Devices that consist of diesel oxidation catalysts, diesel particulate filters, or similar retrofit equipment control technology verified by CARB (http://www.arb.ca.gov/diesel/verdev/verdev.htm);
- Use of low-emissions diesel products or alternative fuels;
- Use of alternative material handling options (e.g., conveyor system); or
- Other options as may become commercially available and verifiable.

Alternatively, in lieu of Mitigation Measures 4.3-3a and 4.3-3b, the Applicant may implement Mitigation Measure 4.3-3c:

Mitigation Measure 4.3-3c: The Applicant shall submit evidence establishing to the County's satisfaction that there are legally-binding restrictions precluding any occupancy of the caretaker's residence during the entirety of Phase 1 of the Project.

Significance after Mitigation: Table 4.3-12 presents the mitigated cancer risks by source category with implementation of Mitigation Measures 4.3-3a and 4.3-3b. The total maximum cancer risk for residence-adult would be 8.7 in one million, which would be below the BAAQMD CEQA threshold of 10 in a million and the impact therefore would be less than significant. With implementation of the alternative mitigation described in Mitigation Measure 4.3-3c, wherein the caretaker's residence would not be occupied and thus would not be a residential receptor, the cancer risk at the next highest residential receptor would be 8.98 in one million (see Table 4.3-11) and the impact therefore would be less than significant.

TABLE 4.3-12
ESTIMATED CANCER RISKS BY EMISSION SOURCE CATEGORY - MITIGATED

Source		Residence – Adult (per million)
Quarrying/Overburden/Unpaved Areas		-0.28
Off-road Equipment		**8.81**
On-road Haul Trucks		0.13
	Total	**8.66**
	Location	**Cupertino Historical Society**

SOURCE: KB Environmental Sciences, Inc, 2011 (included in this EIR as Appendix E)

Impact 4.3-4: The Project would expose people to increased levels of toxic air contaminants, which could increase acute and chronic health risks. (*Less than Significant Impact*)

Non-cancer adverse health risks, both for acute (short-term) and chronic (long-term) timeframes, are measured against a hazard index, which is defined as the ratio of the incremental exposure concentrations of the various non-carcinogens from the project to published reference exposure levels (RELs) that can cause adverse health effects. The RELs are established by OEHHA based on epidemiological evidence. The ratio (referred to as the Hazard Quotient) of each substance with a non-carcinogenic effect that affects a certain organ system is added to produce an overall Hazard Index for that organ system. As a worst case, it was assumed that all of the toxic substances with established RELs would affect the same organ and the individual Hazard Quotients were summed to calculate an overall Hazard Index. RELs are not adjusted for breathing rates, age, and receptor type. If the Hazard Index exceeds 1.0, the health impact is considered to be significant.

As shown in **Table 4.3-13**, the maximum acute hazard impact would be 0.52 at the caretaker's residence and would be due primarily to acrolein (as a component in DPM). The acute hazard impact would be below the significance threshold of 1.0 and therefore less than significant. Note that with Mitigation Measures 4.3-3a and 4.3-3b, the maximum acute hazard impact would be even lower.

TABLE 4.3-13
ESTIMATED ACUTE HAZARD IMPACTS

Project Phase	Residence
Phase 1A	0.52
Phase 1B	0.50
Phase 2	-0.08
Phase 3	0.00
Maximum	**0.52**
Location	**Cupertino Historical Society**

SOURCE: KB Environmental Sciences, Inc, 2011 (included in this EIR as Appendix E)

This analysis also examined acute health risks for recreational users of the Rancho San Antonio Open Space Reserve, who could be exposed to Project emissions for a short term while they are close to the Project site. The analysis found that these impacts would decrease as a result of the implementation of the Project (compared to the No Project Alternative) and therefore would be less than significant.

As shown in **Table 4.3-14**, the maximum chronic hazard impact would be 0.13 at the caretaker's residence and would be due primarily to crystalline silica[7] and DPM. The chronic hazard impact

7 Crystalline silica emissions were estimated using a value for the crystalline silica content of greywacke sandstone, the rock type with the highest crystalline silica content among those mined at the Permanente Quarry.

TABLE 4.3-14
ESTIMATED CHRONIC HAZARD IMPACTS

Project Phase	Residence
Phase 1A	0.13
Phase 1B	0.12
Phase 2	0.04
Phase 3	0.00
Maximum	**0.13**
Location	**Cupertino Historical Society**

SOURCE: KB Environmental Sciences, Inc, 2011 (included in this EIR as Appendix E)

would be below the significance threshold of 1.0 and therefore less than significant. Note that with Mitigation Measures 4.3-3a and 4.3-3b, the maximum chronic hazard impact would be even lower.

Impact 4.3-5: The Project would increase emissions of PM2.5, which could adversely affect human health. ***(Less than Significant Impact with Mitigation Incorporated)***

An analysis also was conducted to determine the maximum annual increase in PM2.5 concentrations for sensitive receptors in the vicinity of the Project. Of note, BAAQMD policy is to conduct this analysis for exhaust emissions only, and that fugitive dust emissions are addressed separately under the application of a fugitive dust plan. Under the Project, the Applicant would continue to comply with their existing Fugitive Dust Control Plan (dated January 21, 2011).

As shown in **Table 4.3-15**, the maximum incremental annual PM2.5 concentration at the caretaker's residence would be 0.40 $\mu g/m^3$, during Phase 1A and 1B, respectively, which would be above the BAAQMD threshold of 0.3 $\mu g/m^3$ and would therefore constitute a potentially significant impact without mitigation.

TABLE 4.3-15
ESTIMATED PM2.5 CONCENTRATION IMPACTS ($\mu g/m^3$)

Project Phase	Residence
Phase 1A	0.40
Phase 1B	0.40
Phase 2	0.10
Phase 3	0.00
Maximum	**0.40**
Location	**Cupertino Historical Society**

SOURCE: KB Environmental Sciences, Inc, 2011 (included in this EIR as Appendix E)

Mitigation Measure 4.3-5: Implement Mitigation Measures 4.3-3a and 4.3-3b (or, alternatively, implement Mitigation Measure 4.3-3c).

Significance after Mitigation: With Mitigation Measures 4.3-3a and 4.3-3b, the maximum incremental annual PM2.5 concentration at the caretaker's residence would be 0.29 $\mu g/m^3$, which would be below the BAAQMD threshold of 0.3 $\mu g/m^3$ and therefore would be less than significant. With implementation of the alternative mitigation described in Mitigation Measure 4.3-3c, wherein the caretaker's residence would not be occupied and thus would not be a residential receptor, the maximum incremental annual PM2.5 concentration at the next highest residential receptor would be below the BAAQMD threshold of 0.3 $\mu g/m^3$ and the impact therefore would be less than significant.

4.3.6 Alternatives

4.3.6.1 Alternative 1: Complete Backfill Alternative

The reclamation activities associated with Alternative 1 would be more extensive than the activities under the Project. Under this alternative, overburden materials stored in the EMSA would be reclaimed and backfilled into the Quarry pit upon the conclusion of mineral extraction. Compared with the Project, that activity would require considerable additional hours of operation for off-road equipment to excavate, transport, dump, and grade the EMSA materials. This additional equipment activity would result in greater emissions of criteria pollutants and TACs compared with the Project, and would therefore have a greater impact with respect to air quality and health risk. Health risk impacts in particular would be greater than for the Project, because the additional equipment activity needed to reclaim the EMSA would generate emissions of TACs in close proximity to the nearest sensitive receptors.

4.3.6.2 Alternative 2: Central Materials Storage Area Alternative

The reclamation activities associated with Alternative 2 would be similar to the activities under the Project, except that under this alternative, overburden materials in the Quarry pit would be moved to new, more-distant locations within the Quarry instead of to the EMSA. That activity would generate additional off-road haul truck travel distance compared with the Project, which in turn would result in greater emissions of criteria air pollutants and TACs. With regard to criteria air pollutants, the increase in emissions compared with the Project would be unlikely to result in a significant impact, as the net change compared to baseline would still be negative and therefore well below the BAAQMD significance levels. However, for TACs, although the emissions would be higher than for the Project, the location of those emissions would be further from the nearest sensitive receptors. Consequently, health risk impacts of this alternative would be similar to or less than for the Project.

4.3.6.3 No Project Alternative

The No Project Alternative would extend the time period in which surface mining activities occur within the Project Area and delay final reclamation conditions by approximately 7 years. Criteria air pollutant emissions under the No Project Alternative would be less on an annual basis and the same or less on a maximum daily basis compared with the Project, but would occur over a longer time. However, since the significance of criteria air pollutant emissions is assessed based on the annual and maximum daily change in emission rates, the No Project Alternative would result in a similar or lesser impact for criteria pollutants compared with the Project.

With regard to health risks from TACs, the HRA prepared for the Project was an incremental analysis that quantified the increase or decrease in health risk for the Project compared with the No Project Alternative. Based on that analysis, the No Project Alternative was found to have lesser impacts related to cancer risk, acute hazards, chronic hazards, and PM2.5 as compared with the Project. Therefore, the No Project Alternative would have overall less impact to health risk than would the Project.

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