4.6 Air Quality

4.6.1 Thresholds of Significance

The Proposed Project would have a significant air quality impact if it would:

1. Conflict with or obstruct the implementation of the RAQS and/or applicable portions of the SIP;

2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation as follows:

    a. Result in emissions that exceed 250 pounds per day of NO_X, or 75 pounds per day of VOCs.

    b. Result in emissions of CO of 550 pounds per day, and when totaled with the ambient concentrations, would exceed a 1-hour concentration of 20 ppm or an 8-hour average of 9 ppm.

    c. Result in emissions of $PM_{2.5}$ that exceed 55 pounds per day.

    d. Result in emissions of PM_{10} that exceed 100 pounds per day and increase the ambient PM_{10} concentration by 5.0 micrograms per cubic meter ($\mu g/m^3$) or greater at the maximum exposed individual.

3. Result in a cumulatively considerable net increase of PM_{10} or $PM_{2.5}$ or exceed quantitative thresholds for ozone precursors, NO_X and VOCs;

4. Expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations as follows:

    a. Place sensitive receptors near CO "hot spots" or creates CO "hot spots" near sensitive receptors.

    b. Result in exposure to TACs resulting in a maximum incremental cancer risk greater than 10 in 1 million with application of Toxics-Best Available Control Technology (T-BACT) or a health hazard index greater than 1.

5. Generate objectionable odors or place sensitive receptors next to existing objectionable odors, which will affect a considerable number of people.

Guideline Numbers 1 through 5 are taken from the County Guidelines for Determining Significance – Air Quality (dated March 19, 2007).

4.6.2 Proposed Project

4.6.2.1 *Analysis of Project Effects and Determination as to Significance*

The Proposed Project would generate both construction and operational emissions. Construction emissions include emissions associated with the Phase 1 site development of the Project. Operational emissions include emissions associated with the Project, including truck traffic, during the course of the operation (Phases 2, 3 and 4).

Conformance to the RAQS (Guideline No. 1)

Consistency with the RAQS and SIP is determined by evaluating consistency of a project with growth anticipated in the relevant General Plan. If a project proposes development that is greater than anticipated in the relevant General Plan and SANDAG's growth projections upon which the RAQS is based, the project potentially would conflict with the RAQS and SIP, and further analysis would be warranted to determine if the project and surrounding projects exceed the growth projections used in the RAQS and SIP for the specific subregional area.

The current 2016 RAQS is based on projections for residential, commercial, industrial and recreational land uses contained in the County's General Plan, OSP and SANDAG's San Diego Forward Regional Plan. In relation to the residential developments, the General Plan, OSP and Regional Plan project greater increases in population (i.e., number of residences and commercial square footages) at buildout than the Proposed Project. Implementation of the Project would result in no residential dwelling units and increased commercial and industrial development than assumed in the County General Plan and EOMSP for the East Otay Mesa Planning Area.

The Project impact footprint is located on land primarily designated as Mixed Industrial and Rural Residential in the EOMSP. The Mixed Industrial designation applies to approximately 35 percent of the 105-acre Project impact footprint. This designation is intended to accommodate industrial plants that primarily engage in the manufacturing, treatment, warehousing or fabrication of materials or products. The land use designation for the remaining 65 percent of the Project impact footprint is Rural Residential (1 dwelling unit [du] per 20 acres). This designation is intended for very low-density residential use on land generally unsuitable for intensive development (consisting of steeper slopes).

The Project Applicant proposes to extract and process approximately 1,600,000 tons of material per year from the Project site. While potential conflicts with the RAQS may occur when a proposed Project seeks to change the land use designations, the effect of project-related emissions on anticipated population also is important. One of the main air pollution control strategies contained in the RAQS and the Regional Plan is the reduction of VMT and the creation of more jobs-producing land uses to create a better jobs-to-housing balance and to reduce commute times and VMT. The Project is consistent with this goal since, as identified in Section 4.14, it would create job opportunities in an area in need of them. Furthermore, because aggregate supply would be consumed with or without the Proposed Project, the Project would not have an effect on overall demand. However, the Project has an effect on the distance that trucks delivering aggregates travel within the region. Project aggregate from the proposed facility would replace materials hauled from farther distances in the south San Diego County region. This rationale is supported by

Dr. Peter Berk's ― *Working Paper No. 994 – A Note on the Environmental Costs of Aggregate"* (Department of Agricultural and Resource Economics and Policy, Division of Agricultural and Natural Resources, University of California Berkley, January 2005).

SANDAG released their *San Diego Region Aggregate Supply Study* in January 2011, which presented information related to the average miles traveled, and associated GHG emissions produced, by vehicles delivering aggregate to project sites. The document explains that if the aggregate is transported by truck from current local mines to local project sites, the average distance between existing mines and construction sites in the region is 26 miles, which are used as VMT projections in the Regional Plan.

The aggregate produced by the Proposed Project would reduce demand on other aggregate operation currently supplying materials over a longer distance. A market analysis of construction aggregate in San Diego County conducted by EnviroMINE determined the average distance between existing mines and aggregate customers in the Otay Hills Quarry market area is approximately 29 miles (EnviroMINE 2020). This same study concluded the average distance for aggregate deliveries from the Proposed Project to this market area would be approximately 10 miles (see Appendix P). The difference in trip length between local and regional trips would help reduce emissions from truck trips.

The Project does not include a residential component; therefore, no direct population growth would result from the Project as compared to what was accounted for in the development of the RAQS. Additionally, and as set forth above, the development would reduce regional VMT and the new employment opportunities resulting from the Proposed Project would improve the current jobs-to-housing ratio by providing jobs to local residents. While the place of residence of the persons accepting employment provided by the proposed uses is uncertain, it is reasonable that a large percentage of these jobs would be filled by persons already living within the Otay Mesa area since there is a relatively large and growing local population (see Subsection 3.14.2.1); therefore, employment projections would remain consistent with regional growth projections and, therefore, consistent with the RAQS.

Emissions projections used to establish APCD attainment objectives reflect adopted regional and local land use plans. Therefore, the emissions associated with the Proposed Project are within the amounts already accounted for in the RAQS, and no significant inconsistency with the RAQS would occur.

The Proposed Project would not result in a significant impact and the Project would be consistent with the RAQS and SIP.

<u>Conformance to Federal and State Ambient Air Quality Standards (Guideline No. 2)</u>

The County recognizes the APCD's established screening level thresholds (SLTs) for air quality emissions (Rules 20.1 et seq.) as screening-level thresholds for land development projects. As part of its air quality permitting process, the APCD has established thresholds in Rule 20.2 for the preparation of AQIAs. The County also recommends use of the South Coast Air Quality Management District's (SCAQMD's) screening threshold of 55 pounds per day or 10 tons per year as a significance threshold for $PM_{2.5}$.

The County also recognized that the Proposed Project consists of industrial type of land uses, and two separate thresholds were used to determine significance. The Proposed Project will generate emissions from two types of sources—stationary source emissions (permitted source) and non-stationary source emissions (non-permitted source). The SDAPCD promulgated AQIA threshold levels for emissions from stationary sources (SDAPCD Rules 20.2 and 20.3). If these incremental levels for stationary sources are exceeded, an AQIA must be performed for the proposed emission sources. Under the Rule 20.2, New Source Review (NSR), prior to construction of the aggregate plant, the Applicant will need to obtain an ATC and Permit to Construct (PTC) from the SDAPCD. The NSR rule requires installation of BACT to reduce emissions as much as practicable. In addition, Rule 20.2 requires emission sources with stationary source emissions greater than certain thresholds for operational emissions in Table 4.6-1 (except for VOC and $PM_{2.5}$) to obtain emission offsets. SDAPCD Rules 20.2 and 20.3 do not have AQIA thresholds for emissions of VOCs and $PM_{2.5}$. Note that the emission offset regulations apply only to stationary emission sources. Stationary source emissions generally include emissions from the aggregate processing plant, cement-treated base (CTB) plant, hot mix asphalt plant (HMA) plant, concrete batch plant, and recycle material plant. All other sources at the Proposed Project site are considered non-stationary emissions sources (i.e., mobile emissions that are not regulated under the SDAPCD authority).

SDAPCD Rule 20.2, which outlines these AQIAs, states that any project which results in an emissions increase equal to or greater than any of these levels, must:

> demonstrate through an AQIA... that the project will not (A) cause a violation of a State or national ambient air quality standard anywhere that does not already exceed such standard, nor (B) cause additional violations of a national ambient air quality standard anywhere the standard is already being exceeded, nor (C) cause additional violations of a State ambient air quality standard anywhere the standard is already being exceeded, nor (D) prevent or interfere with the attainment or maintenance of any State or national ambient air quality standard.

For the Proposed Project, whose stationary emissions are below these AQIA criteria, no dispersion modeling is typically required and project-level emissions are presumed to be less than significant. Although these AQIA trigger levels do not generally apply to mobile sources or non-stationary emission sources, for CEQA purposes, the SLT levels in Table 4.6-1 (for all criteria pollutants) may be used to evaluate the increased emissions that would be discharged to the SDAB from the Proposed Project.

For purposes of air quality analysis, two separate thresholds (i.e., AQIA and CEQA SLTs) can be used to assess if a project's emissions (e.g., stationary emissions, and emissions from mobile sources) would result in a significant impact to air quality. When project emissions have the potential to approach or exceed the AQIA trigger level or SLTs, additional air quality modeling may need to be performed to demonstrate that ground-level concentrations resulting from project emissions (with background levels) would be below federal and state ambient air quality standards.

For CEQA purposes, these screening criteria can be used as numeric metrics to assess if a project's total emissions would result in a significant impact to air quality. The CEQA SLTs are included in Table 4.6-1.

Construction Impacts

The construction activities associated with the Proposed Project would create diesel emissions and would generate dust emissions. During Phase 1 (site development), construction of the aggregate processing plants, operation of earthmoving vehicles and other diesel-powered construction equipment would generate exhaust emissions of CO, NO_X, VOC, SO_X and particulate matter. PM_{10} also would be generated in the form of fugitive dust emissions from earth clearing and grading, and vehicle traffic on unpaved surfaces at the Project site and on access roads. Fugitive dust represents the particles of dust generated and introduced into the atmosphere that do not readily fall back to the ground due to their small size and mass (including PM_{10} and $PM_{2.5}$). Standard construction equipment includes dozers, loaders, scrapers, water truck and delivery trucks. Emissions associated with construction of the Proposed Project were calculated using the USEPA's Tier 2 emission standards for off-road engines and CARB's OFFROAD2007 equipment horsepower ratings and load factors.

The emission calculations were based on the assumption that equipment would be operating on site up to eight hours per day, five days per week. It was assumed that the individual construction components (mass grading, backbone infrastructure, vertical building/installation, and paving) would occur sequentially and each component would begin and be completed during 2020. The equipment activities and emissions assumptions utilized in this analysis are conservative.

APCD Rule 55 prohibits construction or demolition activity that would discharge into the atmosphere beyond the property line dust emissions of 10 percent opacity or greater for a period of three minutes in any 60-minute period. Rule 55 also requires the minimization of visible roadway dust as a result of active operations that generate fugitive dust. Although it was assumed that dust control measures would be implemented, to calculate the most conservative construction estimates, application of water during construction activity was taken into consideration when applying a control efficiency on particulate emissions. Based on the SCAQMD's Fugitive Dust Control Measures Handbook, the control efficiency for watering every three hours via water truck yields an emission reduction of up to 75 percent of PM_{10}. Other control measures such as the CARB off-road equipment regulations were accounted for in the construction emission calculations. Table 4.6-2 presents a summary of the assumed equipment that would be involved in construction.

The Project's plan is to use the same equipment for all four construction components. Tables 4.6-3 and 4.6-4 provide a summary of the emission estimates for the peak daily and annual construction activity for each component, respectively. Mass grading and the installation of backbone infrastructure would occur before, and would not overlap with, building construction and paving. As these activities would never occur on the same day during Phase 1, emissions related to these separate stages of construction are subtotaled in the tables below. As noted above, it was assumed that dust control measures (water application every three hours daily) would be employed to reduce emissions of fugitive dust during on-site construction activities. The resultant emissions from the construction activity are compared to the daily and annual emission thresholds to determine significance.

As shown in Tables 4.6-3 and 4.6-4, with the minimum application of the CARB's off-road equipment regulations, APCD Rule 55 and best management practices to control emissions of fugitive dust discussed below, emissions of all criteria pollutants, including PM_{10}, and $PM_{2.5,}$ would be below the daily thresholds during construction. The resultant maximum daily construction emissions would be applicable to the four construction components listed previously in sequential order. Therefore, construction of the Proposed Project would not conflict with the NAAQS or CAAQS, and the construction impact would be less than significant.

Operational Impacts

Operational emissions were calculated for both criteria and air toxic pollutants. Tables 4.6-5 through 4.6-7 summarize the maximum daily operational emissions of criteria pollutants for Phases 2 through 4, respectively, and Tables 4.6-8 through 4.6-10 summarize the maximum annual emissions. Note that although the quarry would operate at most 305 days per year, the annual emissions are not the product of the maximum daily emissions times 305 days per year. That is because the quarry normally does not operate at the maximum daily level. If the quarry operated at the maximum daily production rate of 8,000 tons per day, the annual production limit would be reached in 200 working days. For purposes of calculating emissions and analyzing short-term impacts, the worst-case maximum daily production level was used. For purposes of calculating emissions and analyzing annual impacts, the annual production rate was used.

Phase 2 would occur between 2021 and 2042, and Phase 3 would occur between 2043 and 2110. With the exception of offsite vehicle trips, emissions would essentially be identical for Phases 2 and 3 of the quarry mining operation. This is because once the 1.6-million metric tons per year extraction rate is reached, it was assumed that the maximum extraction rate would continue for the life of the quarry. There is no difference in maximum extraction rate between Phases 2 and 3. The only difference between Phases 2 and 3 is that the quarry mining would be moved from the hillside to below the natural grade surface (open pit) of the facility. Over time, EMFAC assumes emissions rates for off-site transportation would improve as a result of improved technology or fuels. Thus, Phases 2 and 3 are estimated to have different maximum daily vehicle emissions as a result of emission rates being reduced in 2043 when compared with those for 2021. Most notably, running emissions from delivery trucks drop from 6.46 grams per vehicle mile traveled in 2021 to 3.25 grams per vehicle mile traveled in 2043.

Criteria pollutants from Phases 2 and 3 would be associated with the following activities. All emissions from the aggregate plant, CTB plant, HMA plant, concrete batch plant and recycle material plant are considered to be non-fugitive emissions.

Fugitive Emission Sources

- Fugitive Dust from Excavation: Excavating aggregate materials during operations would generate fugitive dust. Frequent watering (every three hours) in the mining area would reduce fugitive dust emissions.

- On-site Vehicle Exhaust: Bulldozers, loaders and personnel transport vehicles run on internal combustion engines. Internal combustion engines generate NO_X, VOC, CO, PM_{10}, and $PM_{2.5}$ from the combustion of gasoline or diesel fuel. Emissions in this category would include haul truck exhaust while on site but would not include emissions from the haul trucks once off site on public roadways.

- Dust from On-site Vehicle Activity: Various vehicles, such as excavating equipment and pick-up trucks, would traverse unpaved areas and generate dust. Factors affecting dust generation from these sources include: (1) trip length, (2) silt content of road surface material, (3) moisture content of surface, (4) weight of vehicle traveling the road and (5) number of trips per day. Watering or soil stabilizers would control the dust.

- Delivery Trucks and Employee Vehicle Exhaust: The primary sources of emissions in this category would be: (1) trucks hauling aggregate and asphalt produced at the site to customers, (2) trucks hauling cement, cement supplements, diesel fuels, asphalt oil and other raw material to the site, and (3) employee vehicles.

Non-fugitive Emission Sources

- Aggregate Processing: Excavated rock would be trucked from the mining area to the processing plant. The stationary sources (i.e., APCD permitted sources) associated primarily with aggregate processing facility are: a feeder hopper, primary jaw crusher, secondary cone crushers, screens, conveyors, stacking conveyors and aggregate wash plant. At the processing plant, rock would be screened and crushed to size. The transfer points between haul trucks, crushing and screening would generate dust. The screens, crushers and conveyors associated with those devices would be controlled with a combination of wet material, complete enclosure and/or baghouse filters or similar devices.

- Storage Piles and Product Loading: After aggregate is processed, the material is segregated by product type and stockpiled for future shipment. Some fine material remains on the rock after processing. Wind blowing across the stockpiles releases these fine particles and creates dust. Dust also is released when the rock is picked up and loaded onto haul trucks.

- CTB Plant: The CTB plant would be capable of producing a maximum of 400 tons per hour and would be limited to a maximum annual CTB plant production of 320,000 tons. The plant would generate PM_{10} and $PM_{2.5}$ dust. Emissions from these sources are minimized by use of water spray systems on the aggregate to reduce any fugitive dust generated.

- HMA Plant: The asphalt plant would be capable of producing a maximum of 500 tons per hour of asphalt and would be limited to a maximum annual asphalt production of 600,000 tons. The HMA plant would generate emissions from the following sources: the dryer, burner-blower, asphalt cement heating and storage, exhaust fan, blue smoke recovery unit, dust collection system and reclaimed asphalt paving area. The HMA plant would generate VOC, NO_X, CO, SO_X, PM_{10} and $PM_{2.5}$ emissions.

- Concrete Batch Plant: The concrete batch plant would be capable of producing a maximum of 500 cy per hour and would be limited to a maximum annual concrete production of 500,000 cy. The concrete batch plant would generate PM_{10} and $PM_{2.5}$ dust. Emissions from these sources are minimized by use of water spray systems on the aggregate to reduce any fugitive dust generated.

APCD Rules 20.2 and 1200 would be required for each permitted source (i.e., Mining, portable generator, rock crushers, screens, cemented treated based plant, asphalt plant and silos, concrete batch plant and silos, recycled plant, and sand, rock and aggregate primary and secondary plants.).

As shown in Table 4.6-5, the peak daily operational NO_X emissions during Phase 2 would exceed the daily threshold, and therefore would result in a potentially significant impact. The majority of the Phase 2 emissions are a direct result of off-site truck trips. As described previously, the aggregate produced by the Proposed Project would reduce demand on other aggregate operations currently supplying materials over a longer distance. An independent market analysis has estimated that the total distance from other quarries in San Diego County to the Otay Hills Quarry market area is approximately 29 miles. The average distance to the market area from the Proposed Project site is 10 miles. By providing a source of construction aggregate closer to demand the Project would reduce the trip length between the local and regional trips thereby helping to reduce overall emissions in the region. Nevertheless, the Project would result in a significant and unavoidable operational impact to related to emissions of NO_X during Phase 2 (Impact AQ-1). Although Phase 3 is essentially a continuation of Phase 2 activities, NO_X emissions would be reduced to a level of less than significant upon initiation of Phase 3 as a result of off-site transportation emission rates being reduced in 2043 when compared with those for 2021. This reduction is based on assumed improvements in technology and fuel over time in EMFAC. As shown in Tables 4.6-5 through 4.6-7, emissions of all other criteria pollutants would be below the daily thresholds for all operational phases.

In addition to the daily emission analysis, the County also requires the evaluation of the annual operational emissions. For the purpose of this annual analysis, the operational activities are assumed to operate at the maximum annual production rate. As previously mentioned, the operational component activities for each phase would occur simultaneously. The results of the emission calculations are summarized in Tables 4.6-8 through 4.6-10, along with emissions associated with fugitive dust sources and a comparison with the County significance criteria. The resultant annual emissions would be below the annual threshold for each of the three operational phases and therefore would be less than significant for all criteria pollutants.

Blasting Impacts

In order to assess the potential impacts on ambient air quality of blasting activities, the USEPA-approved Open Burn/Open Detonation Dispersion Model (OBODM) model was used to assess the impact of gases released during the blast. The OBODM model uses an assumed worst case meteorological hour to calculate the one-hour average impact of gaseous pollutants created by the explosives (i.e., CO, NO_2, and SO_2). Particulate emissions associated with blasting (i.e., dust created by physical agitation of soil and rock and combustion-related particulates) were included in the Project activities discussed in the Operational Impacts section, above.

Blasting at the site would be conducted using an ammonium nitrate/fuel oil (ANFO) mixture. The USEPA has published emission factors for ANFO explosives in AP-42, Chapter 13.3 (USEPA 1980). The emission factors are 67 pounds of CO per ton of ANFO, 17 pounds of NO_X (assumed NO_2) per ton of ANFO, and two pounds of SO_2 per ton of ANFO exploded. The Proposed Project's blasting activities would occur approximately four times per month and each blast would use a maximum of five tons of ANFO. (The value of four blasts per month is the maximum; on average there would be 50 blasts per year maximum). The maximum one-hour average ambient air quality impacts of the blasting are as shown in Table 4.6-11. Also shown in Table 4.6-11 are the impacts for Ambient Air Quality Standards (AAQS) averaging times. The standard California Air Pollution Control Officers Association (CAPCOA) persistence factors were used to convert 1-hour averages to standard averaging times. The 1-hour average was multiplied by 0.9 to convert it to 3-hour, 0.7 for 8-hour, 0.4 for 24-hour, and 0.1 for annual averages (CAPCOA 1989). The blasting impacts were added to the background concentration in order to compare the total impact to standards. The blasting impacts were not added to the point of maximum impacts of operational activities because they occur at different locations. The OBODM model indicates that the maximum impact point for blasting gases is about 2,600 feet downwind of the blast location, not at the Proposed Project's property boundary as occurs for other emissions such as PM_{10}. As shown in Table 4.6-11, the maximum blasting emissions from the Proposed Project would be below the most stringent ambient air quality standards, and therefore would be less than significant for all criteria pollutants.

The OBODM model evaluates the potential impact of gases released to the atmosphere as the result of the blast. There is also the possibility that some gases could be trapped below the surface and migrate through cracks or fissures below ground. Carefully designed blasting patterns would minimize the potential for trapped gases. In addition, the geology of the proposed quarry is not conducive to such migration. The blasting also would occur at a considerable distance from any residences or other structures that could be impacted. Thus, there would not be potential adverse effects from potential underground migration of blasting gases, and impacts would be less than significant.

In addition to the CO, NO_2 and SO_2 emissions identified by the USEPA in AP-42, Chapter 13.3, there is a possibility that some of the ANFO would not be completely combusted in the blast. However, neither ammonium nitrate nor fuel oil is listed as air toxics in California or by the USEPA. Therefore, potential adverse impacts related to blasting combustion are considered to be less than significant, and impacts would be less than significant.

Traffic-related CO Concentrations (CO Hot Spot Analysis)

Project-generated vehicle trips would increase traffic volumes at roadway intersections in the Project site vicinity once the Project became operational. During periods of near-calm winds, heavily congested intersections can produce elevated levels of CO that could potentially impact nearby sensitive receptors. CO transport is extremely limited and disperses rapidly with distance from the source. Under certain extreme meteorological conditions, however, CO concentrations near a congested roadway or intersection may reach unhealthy levels, affecting sensitive receptors such as residents, school children, hospital patients, and the elderly. Therefore, a CO "hot spot" analysis was conducted to determine whether the Proposed Project would contribute to a violation of the ambient air quality standards for CO at any local intersections.

The Transportation Project-level Carbon Monoxide Protocol (Caltrans 1998) was followed to determine whether a CO hot spot is likely to form due to Project-generated traffic. In accordance with the Protocol, CO hot spots are typically evaluated when (1) the LOS of an intersection decreases to LOS E or worse; (2) signalization and/or channelization is added to an intersection; and (3) sensitive receptors such as residences, commercial developments, schools, hospitals, etc. are located in the vicinity of the affected intersection. In general, CO "hot spots" would be anticipated near affected intersections because the operation of vehicles in the vicinity of congested intersections involves vehicle stopping and idling for extended periods.

To verify that the Project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO “hot spots” was conducted. The TIS (Darnell & Associates, Inc. 2017) evaluated whether or not there would be a decrease in the LOS at the roadways and/or intersections affected by the Project. The potential for CO “hot spots” was evaluated based on the results of the TIS.

The TIS evaluated 10 intersections, 5 roadway segments, and 1 freeway segment in the Project vicinity to evaluate the LOS for Existing, Opening Year 2019, and Cumulative Year 2050. CO “hot spots” would be possible at intersections because intersection traffic is subject to congestion and idling. Based on the traffic analysis, the Project would result in a direct significant traffic impact at the Otay Mesa Road and Alta Road intersection during the AM peak hour under the Opening Year 2019 Plus Project Scenario. All other intersections operate at an acceptable LOS D or better under both scenarios.

The existing maximum 1-hour and 8-hour background concentrations of CO measured at the Chula Vista monitoring station of 1.6 and 1.3 ppm were used to represent future maximum background 1-hour and 8-hour CO concentrations, respectively. CO concentrations in the future may be lower as inspection and maintenance programs and more stringent emission controls are placed on vehicles.

Table 4.6-12 presents a summary of the predicted CO concentrations (impact plus background) for the intersection evaluated for the Opening Year Plus Project traffic at the Otay Mesa Road and Alta Road intersection. As shown in Table 4.6-12, the predicted CO concentrations would be substantially below the 1-hour and 8-hour NAAQS and CAAQS for CO shown in Table 3.6-3 of this EIR. Therefore, no exceedances of the CO standard are predicted, and the Project would not cause or contribute to a violation of the air quality standard. As shown in Table 4.6-12, all impacts, when added to background CO concentrations, would be below the CAAQS for both the 1-hour and 8-hour averaging periods; therefore, the Project would result in a less than significant impact associated with CO.

<u>Cumulative Impacts (Guideline No. 3)</u>

Construction Impacts

The SDAB has been designated as a Federal nonattainment area for ozone, and a State nonattainment area for ozone, PM_{10} and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the SDAB. As discussed above, the emissions of all criteria pollutants, including PM_{10} and $PM_{2.5}$, would be well below the significance levels. Construction would be temporary and consistent with the size and scale of the Proposed Project. Construction activities required for the implementation of the Proposed Project would not result in significant impacts to air quality. While it is likely that construction associated with several other projects would occur in the general vicinity of the Proposed Project, the Project’s contribution to the net cumulative emissions would be minimal due to construction practices that would keep emissions well below the significance thresholds for these pollutants. Therefore, the Project's contribution to cumulative construction emissions would be less than significant.

Operational Impacts

As stated above, the RAQS relies on SANDAG's growth projections based on population, vehicle trends, and land use plans developed by the cities and by the County as part of the development of their general plans. As such, projects that propose a quarry that is consistent with the growth anticipated by local plans would be consistent with the RAQS. Because the Proposed Project is located within San Diego County, the transportation required to move the aggregate would largely be affected by regional truck trips. There are approximately nine active quarry mines located within San Diego County; a number of these facilities will be closing in the near future due to the depletion of the aggregate material. Any quarry installed outside of San Diego County would require longer truck trips, thereby increasing the cost of aggregate supply. The truck trips from the Project site would consist of reallocated truck trips from other closed mines that are no longer producing material to be transported. As these newly allocated trips would still be from a location within the County to project sites within the County, the average miles traveled per truck trip should remain fairly constant, although trips to developing areas in south San Diego County would be reduced.

The Project does not include a residential component; therefore, no direct population growth would result from the Project as compared to what was accounted for in the development of the RAQS. Additionally, and as set forth above, the development would reduce regional VMT and the new employment opportunities resulting from Project would improve the current jobs-to-housing ratio by providing jobs to local residents. While the place of residence of the persons accepting employment provided by the proposed uses is uncertain, it is reasonable that a large percentage of these jobs would be filled by persons already living within the surrounding area; therefore, employment projections would remain consistent with regional growth projections and, therefore, consistent with the RAQS.

As shown in Table 4.6-12, the predicted CO concentrations would be substantially below the 1-hour and 8-hour NAAQS and CAAQS for CO. Therefore, no exceedance of the CO standard at any intersections are predicted to occur under the cumulative year 2020 conditions, and the Project would not cause or contribute to a violation of the air quality standard.

As discussed above, Phase 2 operational NO_X emissions would exceed the screening-level threshold. The Project would be consistent with the RAQS and SIP. It was demonstrated that operational emissions would result in a significant and unavoidable impact. Therefore, the Proposed Project would contribute to a cumulatively considerable net increase in emissions. The majority of the Phase 2 emissions are a direct result of onsite blasting and off-site truck trips. Due to the nature of operations of the Project, no feasible mitigation is available.. Furthermore, as described previously, the aggregate produced by the Proposed Project would reduce demand on other aggregate operations currently supplying materials over a longer distance. An independent market analysis has estimated that the total distance from the other quarries to the Otay Hills Quarry market area is approximately 29 miles. The average distance from the Proposed Project site is 10 miles. By providing a source of construction aggregate closer to demand the Project would reduce the trip length between the local and regional trips thereby helping to reduce overall emissions in the region. Nevertheless, the Project would result in a significant and unavoidable cumulatively considerable impact to related to emissions of NO_X during Phase 2 (Impact AQ-2).

Impacts to Sensitive Receptors (Guideline No. 4)

Construction-related Diesel Particulate Matter

Health risk assessments for diesel engine particulate matter are typically conducted for areas that would expose sensitive receptors to high concentrations of diesel engine particulate over a long period of time. Per guidelines of the California Office of Environmental Health Hazard Assessment (OEHHA) and CAPCOA, estimating the cancer risk from diesel engine particulate is typically not required for construction activities, as they occur for a short period of time (i.e., less than one year) and, therefore, would not measurably increase cancer risk (e.g., less than 9 years for school children, 25 years for off-site workers, and 30 years for residences).

Therefore, construction of the Proposed Project is not anticipated to result in an elevated health risk to exposed persons given the one-year temporary and transitory nature of construction-related diesel exposure. Consequently, the human health impact of diesel risks associated with construction activities is considered to be less than significant.

Operation-related TAC Health Risk

TAC Emissions

Sources of TACs from existing and future quarry operation include diesel-fueled off-road mobile equipment, diesel generators and diesel-fueled haul trucks traveling on and off site. DPM is emitted from all these sources. At the asphalt plant, the drum dryer and hot oil heater would emit DPM because they would combust diesel fuel. Other sources of DPM at the asphalt plant would include diesel-fueled mobile equipment and haul trucks. Other TACS, in the form of metals and organic hydrocarbons, would be emitted from the drum dryer, hot oil heater, asphalt oil storage tanks, asphalt storage silos, from load out of asphalt into trucks, and from fugitive dust sources such as open storage piles, travel on unpaved roads, and rock crushing.

Receptors are shown in Figure 4.6-1, *Location of Sensitive Receptors*, and Table 4.6-13. The CARB-approved Hotspots Analysis Reporting Program (HARP) model (Version 2) was used to evaluate the potential health effects from TACs.

Health Risk Assessment (HRA) Analysis

Cancer, acute, and chronic health risks due to exposure to TACs were evaluated following the latest guidance outlined in the *Air Toxics Hot Spots Program Risk Assessment Guidelines*. The CARB's HARP, Version 2, was used for HRA modeling. The HARP Risk Module predicts health impacts terms of cancer risk, hazard index acute (HIA), and hazard index chronic (HIC) by factoring AERMOD-predicted pollutant concentrations by pollutant-specific cancer potency values and chronic/acute Reference Exposure Levels (REL) obtained from OEHHA. The HARP average point-estimate was used in the analysis. For residential exposure, it is assumed that the person is exposed continuously to the maximum concentration for 30 years. For workers' health risks, it was assumed that a worker is exposed 250 days per year for 25 years.

HARP modeling was conducted for sensitive receptors near the Proposed Project area, including residents and representative locations of living communities. Nearby residents included in the HRA include the four residential homes located within approximately 2 miles of the Project site. The closest to the Project site are three residences located on Old Otay Mesa Road, directly west of the Project site and approximately midway between Harvest Road and Alta Road. Another house is located between the two prison facilities, accessed via a dirt road off of Alta Road before Alta Road reaches the County East Mesa Detention facility.

The acute, chronic and cancer risk modeling were applied to the air toxics that could be emitted from the Proposed Project for which RELs and URFs were published by the OEHHA. The modeling was done for Phases 2 and 3 operations only Because the Phases 2 and 3 emissions are generally higher than Phases 1 and 4, it can be assumed that if Phases 2 and 3 result in a less than significant health risk then Phases 1 and 4 would as well.

Potential chronic health effects from construction are of short duration (not more than one year), so the exposure is one to three percent of that assumed in the REL and URF factors. A health risk assessment for construction, however, was not necessary for the Proposed Project.

The potential for health effects at actual receptors where there is a potential for exposure is termed a maximum exposed individual (MEI) analysis. Nickel has a potential for non-cancer effects. For non-cancer effects, the hazard index is calculated, and if the hazard index (HI) is less than 1.0, then there is no potential for non-cancer health effects. The HI is normally calculated assuming that both workers and residences are exposed continuously for a lifetime. Thus, the annual average concentration is divided by the REL to calculate a chronic HI, with no adjustment for worker versus residential exposure. Because the HI is the ratio of the exposed concentration to the REL, the HI is can be converted to a percent of the REL by multiplying by 100. That is, an HI of 0.02 is two percent of the REL.

For potential carcinogenic effects, the incremental cancer risk as the result of the exposure is calculated. For residential exposure, it is assumed that the person is exposed continuously to the maximum concentration for 30 years. In actuality, people rarely reside at the same location for 30 years and are never continuously exposed to the maximum concentration. To calculate the incremental cancer risk the URF is multiplied by the chronic (annual) concentration. The URF expresses the probability that a person could contract cancer if the person were exposed to 1 $\mu g/m^3$ of the pollutant continuously for a lifetime. The URFs are based on a 70-year exposure applicable to residences. In addition, workers do not typically work in the same place for 70 years.

Cancer risk probability is often expressed as the number of cases of cancer that could occur if one million persons were exposed. This is calculated by multiplying the cancer risk times one million. Cancer risks less than 1 in 1 million, or 10 in 1 million with T-BACT, are considered acceptable by the APCD under Rule 1201. The results for Phases 2 and 3 operational activities are shown in Table 4.6-13 for HI and for cancer risk. The chronic and acute HIs are less than 1.0 and the cancer risk is much less 10 in 1 million. The results in Table 4.6-13 for the MEI off-site worker are overstated by a very large margin, as the maximum impacted receptor, Otay Mesa Power Plant, which is a peaking power plant, is not continuously operated. Therefore, the worker exposure adjustment factor is much less than 0.20.

Conclusion

The impacts from exposure to TACs from Project-related operational activities are considered to be less than significant.

Odor Impacts (Guideline No. 5)

According to the County's Zoning Ordinance, Section 6318, "all commercial and industrial uses shall be so operated as to not emit matter causing unpleasant odors which are perceptible by the average person at or beyond any lot line of the lot containing said uses." In general, this ordinance applies to industrial land uses. The mining operation itself would not be a source of odor impacts. According to the SCAQMD's CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting activities, refineries, landfills, dairies, and fiberglass molding operations. These objectionable odors-related land uses are not proposed for the Project.

Construction Impacts

Minor odors would be generated from vehicles and/or equipment exhaust emissions during construction of the Proposed Project. Odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of heavy-duty equipment and vehicles. Such odors are temporary and may create an occasional "whiff" of diesel exhaust that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be considered less than significant.

Operation Impacts

The Project would generate potential odors and gaseous fumes by evaporative emissions and tailpipe emissions from vehicles and diesel-powered equipment during operations. Odor impacts would be limited to the traffic circulation routes and unloading/loading areas. Odors associated with diesel exhaust may be detectable for a short period but would not be located in a singular area and would quickly disperse.

Operation of the asphalt plant, the only major odor source for the Proposed Project, would emit a number of hydrocarbon compounds that are considered by many people to be objectionable. H_2S is the most emissive hydrocarbon compound from the HMA operation. Emissions of odorous H_2S compounds would be reduced by implementation of BACT such as fiber bed mist collectors, as required by the APCD. Nonetheless, odors would still be emitted from the facility even with these controls.

Odor produced from a project that creates an odor nuisance pursuant to APCD Rule 51 is considered a potential significant impact. The nearest residence to the proposed asphalt plant site is located approximately 1.3 miles away. Although odor has been associated with asphalt plants in the past, modern emission control techniques required by APCD regulations and silo storage vented through a baghouse greatly reduce the potential for odors. The facility would practice a "blue smoke" program whereby routine visual inspection of the plant is conducted to ensure that there are not significant sources of fugitive emissions; the facility operators also would practice other nationally accepted practices, such as additives and odor-control technology, that reduce the potential for odor from asphalt production.

It is also noted that the asphalt plant would have to obtain an authority to construct and permit to operate from the APCD. As part of the permitting process, the Applicant would need to demonstrate to the satisfaction of the APCD permitting staff that the plant would be equipped with BACT for controlling air emissions. Although the odors from the asphalt plant are not likely to cause a nuisance, the wind direction is favorable to nearby residents, and the asphalt plant design would reduce odor to insubstantial levels.

A blue smoke control method would apply to all plant components which would entail collecting and transporting hydrocarbon-laden air. Individual pieces of the blue smoke control system must all work together to form a scavenger system. This involves:

- Sealing all material transfer points to trap blue smoke (from dryer to silo, and from silo to hopper for haul trucks),
- Ductwork to transport smoke from collection points (from the dryer exhaust stack, silo tops, and the truck loadout zone) to the chosen disposal method,
- Utilizing separate scavenger fan to convey captured emissions through the ductwork, and
- Installing dampers within the ductwork to control airflow.

Blue smoke systems are likely to become a standard pollution control device for the hot-mix asphalt facility.

Because odor-producing operations are monitored, impacts to adjacent sensitive receptors (the nearest of which is located about two miles away) are not anticipated. Because of truck travel associated with the asphalt oil that is delivered to the Project site and the asphalt product that is transported from the Project site to a construction site is essentially all on the freeway, the trucks are traveling at relatively high speeds. At freeway speeds, odor is not detected because of the rapid dispersion of any potential odor-causing chemicals. When the asphalt trucks are traveling at low speed on local arterial thoroughfares, there may be a brief detectable local asphalt odor. Nonetheless, because odor-producing operations would be monitored, impacts to adjacent sensitive receptors, the nearest of which is located approximately 1.3 miles away, are not anticipated.

During Phase 4 of the Proposed Project, the open pit would be backfilled with inert debris and fill material. The rate of backfill is estimated at 500,000 cy per year. All fill material would be inspected upon arrival to ensure that contaminated soils or garbage are not present. Only clean demolition materials from redevelopment projects would be considered as an inert fill material. No sanitary waste would be disposed at the Project site, as all sanitary waste must be disposed at other local sanitary landfills or hauled to locations where sanitary waste receiver sites are available. The inert debris and fill materials would not generate any odors at the Proposed Project site.

4.6.2.2 *Significance of Impacts Prior to Mitigation*

The Project is consistent with the General Plan and would not exceed the growth projections in the SANDAG growth forecasts for the OSP Area; therefore, impacts associated with Project potential interference with the RAQS would be less than significant.

The peak daily operational NO_X emissions during Phase 2 would exceed the daily threshold and would, therefore, result in a direct (Impact AQ-1) and cumulative (Impact AQ-2) significant operational impact. Emissions of all other criteria pollutants would be below the screening-level and significant thresholds for Project construction and operations and, therefore, would be less than significant under CEQA.

Both construction-period and operational health risk effects related to DPM would be less than significant.

An evaluation of odors indicated that odor impacts would be less than significant.

4.6.2.3 *Mitigation Measures*

As shown in Table 4.6-5, the peak daily operational NO_X emissions during Phase 2 would exceed the daily threshold and, therefore, would contribute to a cumulatively considerable net increase in emissions. To help reduce emissions from heavy duty off-road equipment, the Project includes a project design feature requiring that all heavy duty off-road equipment operating on the Project site meet the state of California's Off-road Vehicle Regulations with a minimum of Tier 2 engines for Phases 1 and 2 and a minimum of Tier 4 engines for Phases 3 and 4. The equipment used onsite would be brought over from other Applicant operated quarries scheduled for closure or reduced output due where they are in their lifecycle. It would be cost prohibitive to purchase brand new Tier 4 equipment to replace the entire fleet, but Tier 4 equipment would be phased in over time so that upon the start of Phase 3 all equipment would achieve Tier 4 standards.

The majority of the Phase 2 emissions are a direct result of onsite blasting and off-site truck trips. Due to the nature of operations of the Project, no feasible mitigation is available.. Furthermore, as described previously, the aggregate produced by the Proposed Project would reduce demand on other aggregate operations currently supplying materials over a longer distance. A market analysis has estimated that the total distance from the other quarries to the Otay Hills Quarry market area is approximately 29 miles (see Appendix P). The average distance from the Proposed Project site is 10 miles. The difference in the trip length between the local and regional trips would help reduce the emissions from the truck trips. Nevertheless, the Project would result in direct (Impact AQ-1) and cumulative (Impact AQ-2) significant and unavoidable impacts to related to emissions of NO_X during Phase 2.

4.6.2.4 *Conclusion*

The Project would result in direct (Impact AQ-1) and cumulative (Impact AQ-2) significant and unavoidable impacts to related to emissions of NO_X during Phase 2.

4.6.3 Extraction to Natural Grade Alternative

4.6.3.1 *Analysis of Project Effects and Determination as to Significance*

The Extraction to Natural Grade Alternative would involve the same operations and the same footprint as the Proposed Project but would only extract rock material to natural grade elevation and the timeframe of operation would be shorter (20 years versus approximately 120 years for the Proposed Project). Because the Proposed Project would result in a significant and unavoidable operational impact related to emissions of NO_X during Phase 2, it can be assumed that significant and unavoidable impacts related to emissions of NO_X would occur for the Extraction to Natural Grade Alternative. Because the Proposed Project would result in less than significant impacts to all other issues associated with air quality, it can be assumed that less than significant impacts to all other issues associated with air quality would occur for the Extraction to Natural Grade Alternative.

4.6.3.2 *Significance of Impacts Prior to Mitigation*

The Natural Grade Alternative would result in in direct (Impact AQ-1) and cumulative (Impact AQ-2) significant and unavoidable impacts related to emissions of $NO_{X.}$ All other impacts associated with air quality would be less than significant.

4.6.3.3 *Mitigation Measures*

As with the Proposed Project, due to the nature of operations of the Natural Grade Alternative, no feasible mitigation is available.

4.6.3.4 *Conclusion*

The Extraction to Natural Grade Alternative would result in in direct (Impact AQ-1) and cumulative (Impact AQ-2) significant and unavoidable impacts related to emissions of $NO_{X.}$ All other impacts associated with air quality would be less than significant.

4.6.4 Extraction to Varying Depth Alternative

4.6.4.1 *Analysis of Project Effects and Determination as to Significance*

The Extraction to Varying Depth Alternative would involve the same operations and the same footprint as the Proposed Project and would consist of four phases which would be consistent with the four phases of the Proposed Project. Because the Proposed Project would result in a significant and unavoidable operational impact related to emissions of NO_X during Phase 2, it can be assumed that significant and unavoidable impacts related to emissions of NO_X would occur for the Extraction to Varying Depth Alternative. Because the Proposed Project would result in less than significant impacts to all other issues associated with air quality, it can be assumed that that less than significant impacts to all other issues associated with air quality would occur for the Extraction to Varying Depth Alternative.

4.6.4.2 *Significance of Impacts Prior to Mitigation*

The Extraction to Varying Depth Alternative would result in in direct (Impact AQ-1) and cumulative (Impact AQ-2) significant and unavoidable impacts related to emissions of $NO_{X.}$ All other impacts associated with air quality would be less than significant.

4.6.4.3 *Mitigation Measures*

As with the Proposed Project, due to the nature of operations of the Extraction to Varying Depth Alternative, no feasible mitigation is available.

4.6.4.4 *Conclusion*

The Extraction to Varying Depth Alternative would result in direct (Impact AQ-1) and cumulative (Impact AQ-2) significant and unavoidable impacts related to emissions of $NO_{X.}$ All other impacts associated with air quality would be less than significant.

4.6.5 No Project/Existing Plan Alternative

4.6.5.1 *Analysis of Project Effects and Determination as to Significance*

In accordance with the EOMSP, the No Project/Existing Plan Alternative would include the development of industrial uses on approximately 62 acres and the development of 12 dwelling units on 254 acres, which equates to an approximate density of one unit per 20 acres.

It is assumed that the No Project/Existing Plan Alternative would be compliant with federal, state, and local orders, ordinances, and regulations related to reductions in GHG and minimization of contribution to climate change. Standard BMPs, including watering twice per day for control of fugitive dust, are assumed to occur during construction of the No Project/Existing Plan Alternative. In accordance with the San Diego County Grading Ordinance, Section 87.428, dust control measures must be implemented for all grading projects taking place in the County of San Diego. In addition, because the No Project/Existing Plan Alternative is assumed to be consistent with the EOMSP and, therefore, consistent with the RAQS and SIP, the operational emissions associated with the No Project/Existing Plan Alternative would not be significant.

Accordingly, it can be assumed that less than significant impacts associated with air quality are anticipated for the No Project/Existing Plan Alternative.

4.6.5.2 *Significance of Impacts Prior to Mitigation*

All impacts associated with air quality would be less than significant.

4.6.5.3 *Mitigation Measures*

Because no significant impact would occur, no mitigation measures would be required.

4.6.5.4 *Conclusion*

No significant impacts relating to air quality would occur as a result of implementation of the No Project/Existing Plan Alternative and, therefore, no mitigation would be required for this alternative.

4.6.6 No Project Alternative

4.6.6.1 *Analysis of Project Effects and Determination as to Significance*

Under the No Project Alternative, the project area would remain vacant, and no changes in the existing environment would occur. Therefore, there would be no additional criteria pollutant emissions from construction or operations in the project area.

4.6.6.2 *Significance of Impacts Prior to Mitigation*

No air quality impacts would occur.

4.6.6.3 *Mitigation Measures*

Because no significant impact would occur, no mitigation measures would be required.

4.6.6.4 *Conclusion*

The No Project Alternative would not generate additional criteria pollutant emissions, and no mitigation measures would be necessary.

Table 4.6-1
SCREENING-LEVEL THRESHOLDS FOR AIR QUALITY IMPACT ANALYSIS

Pollutant	**Total Emissions**		
Construction Emissions			
	Pounds per Day		
Respirable particulate matter (PM_{10})	100		
Fine particulate matter ($PM_{2.5}$)	55		
Oxides of nitrogen (NO_X)	250		
Oxides of sulfur (SO_X)	250		
Carbon monoxide (CO)	550		
Volatile organic compounds (VOCs)	75		
Operational Emissions			
	Pounds per Hour	**Pounds per Day**	**Tons per Year**
Respirable particulate matter (PM_{10})	---	100	15
Fine particulate matter ($PM_{2.5}$)	---	55	10
Oxides of nitrogen (NO_X)	25	250	40
Oxides of sulfur (SO_X)	25	250	40
Carbon monoxide (CO)	100	550	100
Lead (Pb) and lead compounds	---	3.2	0.6
Volatile organic compounds (VOCs)	---	75	13.7
Toxic Air Contaminant Emissions			
Excess cancer risk	1 in 1 million 10 in 1 million with T-BACT		
Non-cancer hazard	1.0 hazard index		

Source: APCD Rule 20.2 and Rule 1210, County 2007
Note: Thresholds for VOCs and $PM_{2.5}$ based on the threshold of significance for VOCs and $PM_{2.5}$ from the SCAQMD for the Coachella Valley.

Table 4.6-2 CONSTRUCTION STAGES AND EQUIPMENT REQUIREMENTS										
Off-road Equipment Type	**Horsepower**	**Load Factor**	**Grading**		**Backbone Infrastructure**		**Building Construction**		**Paving**	
			Pieces	**Hours**	**Pieces**	**Hours**	**Pieces**	**Hours**	**Pieces**	**Hours**
Aerial lift	63	0.31	-	-	-	-	2	8	-	-
Air compressors	78	0.48	-	-	-	-	2	8	-	-
Bore/drill rigs	221	0.50	-	-	1	8	-	-	-	-
Cement and mortar mixers	9	0.56	-	-	-	-	2	8	1	8
Cranes	231	0.29	-	-	-	-	2	4	-	-
Crawler tractors	212	0.43	2	8	-	-	-	-	4	8
Dumpers/tenders	16	0.38	4	4	-	-	-	-	2	4
Excavators	158	0.38	-	-	1	8	1	4	-	-
Forklifts	89	0.20	-	-	1	8	4	8	-	-
Generator sets	84	0.74	-	-	-	-	3	8	-	-
Graders	187	0.41	2	8	-	-	-	-	1	8
Off-highway tractors	124	0.44	1	8	1	8	1	8	1	4
Off-highway trucks	402	0.38	4	8	2	8	-	-	1	4
Other construction equipment	172	0.42	2	4	2	4	2	4	2	4
Other general industrial equipment	88	0.34	1	4	1	4	4	4	-	-
Pavers	130	0.42	-	-	-	-	-	-	1	8
Paving equipment	132	0.36	-	-	-	-	-	-	2	8
Plate compactors	8	0.43	-	-	-	-	2	8	1	8
Pressure washers	13	0.30	-	-	-	-	2	8	-	-
Pumps	84	0.74	-	-	-	-	1	8	-	-
Rollers	80	0.38	2	8	-	-	-	-	1	8
Rough terrain forklifts	100	0.40	-	-	-	-	2	8	-	-
Rubber tired dozers	247	0.40	4	4	-	-	-	-	1	4
Rubber tired loaders	203	0.36	2	8	-	-	-	-	1	8
Scrapers	367	0.48	4	8	-	-	-	-	-	-
Skid steer loaders	65	0.37	2	8	-	-	1	8	-	-
Sweepers/scrubbers	64	0.46	-	-	-	-	1	4	-	-

Table 4.6-2 (cont.)
CONSTRUCTION STAGES AND EQUIPMENT REQUIREMENTS

Off-road Equipment Type	Horsepower	Load Factor	Grading		Backbone Infrastructure		Building Construction		Paving	
			Pieces	Hours	Pieces	Hours	Pieces	Hours	Pieces	Hours
Tractors/loaders/backhoes	97	0.37	2	8	2	8	2	8	-	-
Trenchers	78	0.50	-	-	1	8	-	-	-	-
Welders	46	0.45	-	-	-	-	8	8	-	-

Source: HELIX 2020b

Table 4.6-3
ESTIMATED DAILY CONSTRUCTION EMISSIONS FOR EACH COMPONENT – PHASE 1 (2020)

Source	Daily Emissions (pounds per day)					
	VOC	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Grading and Backbone Infrastructure						
Mass grading	13.68	85.12	152.36	0.21	6.30	5.80
Backbone infrastructure	3.70	29.56	36.98	0.07	1.82	1.67
Employees and delivery trucks	0.98	2.99	12.38	0.03	0.41	0.23
TOTAL	**18.36**	**117.67**	**201.71**	**0.31**	**8.52**	**7.70**
Daily Threshold	75	550	250	250	100	55
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Vertical Construction and Paving						
Building construction	8.66	68.67	68.17	0.11	3.83	3.67
Paving	5.73	3.74	66.50	0.08	2.75	2.53
Employees and delivery trucks	0.98	2.99	12.38	0.03	0.41	0.23
TOTAL	**15.37**	**105.40**	**147.04**	**0.23**	**6.99**	**6.43**
Daily Threshold	75	550	250	250	100	55
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: HELIX 2020b
Note: Fugitive dust measures were applied to control PM_{10} and $PM_{2.5}$ dust emissions.
VOC = volatile organic compound; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM_{10} = particulate matter 10 or less microns in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

Table 4.6-4
ESTIMATED ANNUAL CONSTRUCTION EMISSIONS FOR EACH COMPONENT – PHASE 1 (2020)

Source	Annual Emissions (tons per year)					
	VOC	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Grading and Backbone Infrastructure						
Mass grading	0.14	0.85	1.52	0.00	0.06	0.06
Backbone infrastructure	0.03	0.22	0.28	0.00	0.01	0.01
Employees and delivery trucks	0.13	0.39	1.61	0.00	0.05	0.03
TOTAL	**0.29**	**1.46**	**3.41**	**0.01**	**1.13**	**0.10**
Annual Threshold	13.7	100	40	40	15	10
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Vertical Construction and Paving						
Building construction	0.11	0.89	0.89	0.00	0.05	0.05
Paving	0.03	0.17	0.33	0.00	0.01	0.01
Employees and delivery trucks	0.13	0.39	1.61	0.00	0.05	0.03
TOTAL	**0.27**	**1.45**	**2.83**	**0.01**	**0.12**	**0.09**
Annual Threshold	13.7	100	40	40	15	10
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: HELIX 2020b
Note: Fugitive dust measures were applied to control PM_{10} and $PM_{2.5}$ dust emissions.
VOC = volatile organic compound; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM_{10} = particulate matter 10 or less microns in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

Table 4.6-5
TOTAL PEAK DAILY OPERATIONAL EMISSIONS FOR PHASE 2 (2021 - 2042)

Source	Daily Emissions (pounds per day)					
	VOC	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Non-Permitted Emission Sources						
Bulldozing and overburden	-	-	-	-	9.03	4.97
Blasting and drilling	-	335.00	85.00	10.00	12.97	1.19
Portable sand screen	-	-	-	-	5.92	0.40
Wind erosion of exposed active areas	-	-	-	-	0.17	0.03
Delivery trucks and employee trips	0.95	4.57	9.10	0.02	0.17	0.12
Heavy duty equipment operations	5.05	30.51	50.26	0.09	2.18	2.02
Off-site Truck/Employee Vehicle Trips	12.14	32.62	185.68	0.49	5.99	3.35
Unpaved road dust	-	-	-	-	57.31	5.73
Fuel/oil storage tanks	0.02	-	-	-	-	-
TOTAL	18.15	402.70	330.05	10.60	93.16	19.90
CEQA Significance Thresholds	75	550	250	250	100	55
Exceedance?	**No**	**No**	**Yes**	**No**	**No**	**No**
Permitted Emission Sources						
Rock crushing	-	-	-	-	44.99	8.24
Storage piles	-	-	-	-	1.52	0.45
Cement treated base	-	-	-	-	1.62	0.37
Hot mix asphalt	89.83	138.67	26.90	3.43	19.42	11.01
Concrete batch plant	-	-	-	-	4.71	1.79
Recycled materials	-	-	-	-	7.28	1.04
TOTAL	89.83	138.67	26.90	3.43	79.53	22.89
AQIA Significance Thresholds	N/A	550	250	250	100	N/A
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**

Source: HELIX 2020b
VOC = volatile organic compound; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM_{10} = particulate matter 10 or less microns in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

Table 4.6-6
TOTAL PEAK DAILY OPERATIONAL EMISSIONS FOR PHASE 3 (2043 - 2110)

Source	Daily Emissions (pounds per day)					
	VOC	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Non-Permitted Emission Sources						
Bulldozing and overburden	-	-	-	-	9.03	4.97
Blasting and drilling	-	335.00	85.00	10.00	12.97	1.19
Portable sand screen	-	-	-	-	5.92	0.40
Wind erosion of exposed active areas	-	-	-	-	0.17	0.03
Delivery trucks and employee trips	0.95	4.57	9.10	0.02	0.17	0.12
Heavy duty equipment operations	5.05	30.51	50.26	0.09	2.18	2.02
Off-site Truck/Employee Vehicle Trips	1.04	12.75	96.61	0.36	3.19	0.68
Unpaved road dust	-	-	-	-	57.31	5.73
Fuel/oil storage tanks	0.02	-	-	-	-	-
TOTAL	7.06	382.83	240.97	10.47	90.36	17.23
CEQA Significance Thresholds	75	550	250	250	100	55
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**
Permitted Emission Sources						
Rock crushing	-	-	-	-	44.99	8.24
Storage piles	-	-	-	-	1.52	0.45
Cement treated base	-	-	-	-	1.62	0.37
Hot mix asphalt	89.83	138.67	26.90	3.43	19.42	11.01
Concrete batch plant	-	-	-	-	4.71	1.79
Recycled materials	-	-	-	-	7.28	1.04
TOTAL	89.83	138.67	26.90	3.43	79.53	22.89
AQIA Significance Thresholds	N/A	550	250	250	100	N/A
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**

Source: HELIX 2020b
VOC = volatile organic compound; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM_{10} = particulate matter 10 or less microns in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

Table 4.6-7
TOTAL PEAK DAILY OPERATIONAL EMISSIONS FOR PHASE 4 (POST 2110)

Source	**Daily Emissions (pounds per day)**					
	VOC	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
On-site Reclamation	-	-	-	-	25.95	2.66
On-site Bulldozing and overburden	-	-	-	-	9.03	4.97
On-site Delivery trucks and employee trips	0.41	1.70	4.85	0.01	0.13	0.09
On-site Unpaved road dusts	-	-	-	-	4.51	0.45
Heavy duty equipment operations	5.05	30.51	50.26	0.09	2.18	2.02
Off-site Trucks and Employee Trips	0.38	3.62	23.22	0.09	0.79	0.17
TOTAL	**5.84**	**35.83**	**78.34**	**0.19**	**42.59**	**10.35**
CEQA Significant Thresholds	75	550	250	250	100	55
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**

Source: HELIX 2020b
VOC = volatile organic compound; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM_{10} = particulate matter 10 or less microns in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

Table 4.6-8
TOTAL ANNUAL OPERATIONAL EMISSIONS FOR PHASE 2 (2020 - 2042)

Source	Annual Emissions (tons per year)					
	VOC	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Non-Permitted Emission Sources						
Bulldozing and overburden	-	-	-	-	0.23	0.12
Blasting and drilling	-	8.38	2.13	0.25	0.58	0.08
Portable sand screen					0.59	0.04
Wind erosion of exposed active areas	-	-	-	-	0.17	0.005
Delivery trucks and employee trips	0.09	0.43	0.83	0.00	0.02	0.01
Heavy-duty equipment operations	0.40	2.70	3.95	0.01	0.16	0.15
Off-site Truck/Employee Vehicle Trips	1.58	4.24	24.14	0.06	0.78	0.44
Unpaved road dust	-	-	-	-	4.50	0.45
Fuel/oil storage tanks	0.00	-	-	-	-	-
Total	**2.07**	**15.74**	**31.04**	**0.32**	**7.03**	**1.30**
CEQA Significant Thresholds	13.7	100	40	40	15	10
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**
Non-Permitted Emission Sources						
Rock crushing	-	-	-	-	4.50	0.82
Storage piles	-	-	-	-	0.28	0.08
Cement treated base	-	-	-	-	0.06	0.01
Hot mix asphalt	2.00	7.92	1.61	0.20	0.60	0.42
Concrete batch plant	-	-	-	-	0.02	0.01
Recycled materials	-	-	-	-	1.11	0.16
Total	**2.00**	**7.92**	**1.61**	**0.20**	**6.57**	**1.51**
AQIA Significant Thresholds	N/A	100	40	40	15	10
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**

Source: HELIX 2020b
VOC = volatile organic compound; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM_{10} = particulate matter 10 or less microns in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

Table 4.6-9
TOTAL ANNUAL OPERATIONAL EMISSIONS FOR PHASE 3 (2043 - 2110)

Source	Annual Emissions (tons per year)					
	VOC	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Non-Permitted Emission Sources						
Bulldozing and overburden	-	-	-	-	0.23	0.12
Blasting and drilling	-	8.38	2.13	0.25	0.58	0.08
Portable sand screen					0.59	0.04
Wind erosion of exposed active areas	-	-	-	-	0.17	0.005
Delivery trucks and employee trips	0.09	0.43	0.83	0.00	0.02	0.01
Heavy-duty equipment operations	0.40	2.70	3.95	0.01	0.16	0.15
Off-site Truck/Employee Vehicle Trips	0.14	1.66	12.56	0.05	0.42	0.09
Unpaved road dust	-	-	-	-	4.50	0.45
Fuel/oil storage tanks	0.00	-	-	-	-	-
Total	**0.63**	**13.16**	**19.46**	**0.31**	**6.67**	**0.95**
CEQA Significant Thresholds	13.7	100	40	40	15	10
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**
Permitted Emission Sources						
Rock crushing	-	-	-	-	4.50	0.82
Storage piles	-	-	-	-	0.28	0.08
Cement treated base	-	-	-	-	0.06	0.01
Hot mix asphalt	2.00	7.92	1.61	0.20	0.60	0.42
Concrete batch plant	-	-	-	-	0.02	0.01
Recycled materials	-	-	-	-	1.11	0.16
Total	**2.00**	**7.92**	**1.61**	**0.20**	**6.57**	**1.51**
AQIA Significant Thresholds	N/A	100	40	40	15	10
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**

Source: HELIX 2020b
VOC = volatile organic compound; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM_{10} = particulate matter 10 or less microns in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

Table 4.6-10 TOTAL ANNUAL OPERATIONAL EMISSIONS FOR PHASE 4 (POST 2110)						
Source	**Annual Emissions (tons per year)**					
	VOC	**CO**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
On-site Reclamation	-	-	-	-	2.37	0.24
On-site Bulldozing and overburden	-	-	-	-	0.23	0.12
On-site Delivery trucks and employee trips	0.04	0.16	0.44	0.00	0.01	0.01
On-site Unpaved road dust	-	-	-	-	0.66	0.07
Heavy duty equipment operations	0.40	2.70	3.95	0.01	0.16	0.15
Off-Site Trucks and Employee Trips	0.05	0.47	3.02	0.01	0.10	0.02
TOTAL PHASE 4	**0.49**	**3.34**	**7.41**	**0.02**	**3.55**	**0.61**
Significant Thresholds	13.7	100	40	40	15	10
Exceedance?	**No**	**No**	**No**	**No**	**No**	**No**

Source: HELIX 2020b
VOC = volatile organic compound; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; PM_{10} = particulate matter 10 or less microns in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

Table 4.6-11 MAXIMUM IMPACT OF BLASTING							
Pollutant	**Maximum 1-hour Impact (μg/m^3)**	**AAQS Averaging Time**	**Maximum Blasting Impact for AAQS Averaging Time (μg/m^3)**	**Background (μg/m^3)**	**Total of Background, Blasting Maximum and PMI Maximum (μg/m^3)**	**Most Stringent AAQS (μg/m^3)**	**Exceeds CAAQS?**
CO	92	1-hour	92	3,565	3,657	23,000	**No**
		8-hour	64	2,489	2,553	10,000	**No**
NO_2	23	1-hour	23	15	38	339	**No**
		Annual	2	3	5	57	**No**
SO_2	03	1-hour	3	21	24	196	**No**
		3-hour	2	21	23	1,300	**No**
		24-hour	1	11	12	105	**No**
		Annual	1	8	9	80	**No**

Source: HELIX 2020b
μg/m^3 = micrograms per cubic meter

Table 4.6-12
CO "HOT SPOTS" MODELING RESULTS –
HORIZON YEAR CONDITIONS WITH PROJECT (2020)

Intersection	**Maximum 1-hour CO Concentration Plus Background (ppm)**		**Maximum 8-hour CO Concentration Plus Background (ppm)**
	AM	**PM**	
Otay Mesa Road/Alta Road	2.2	2.1	1.7
CAAQS Standard	20	20	9
Exceedance?	No	No	No

Source: HELIX 2020b
Notes:
1. Peak hour traffic volumes are based on the TIS prepared for the Project by Darnell & Associates (2017).
2. Highest three years APCD (2014-2016) 1-hour ambient background concentration (1.6 ppm) + 2020 modeled CO 1-hour contribution.
3. Highest three years APCD 8-hour ambient background concentration (1.3 ppm) + 2020 modeled CO 8-hour contribution.
CO = carbon monoxide; ppm = parts per million

Table 4.6-13
CANCER RISK AND HAZARD INDICES AT THE MAXIMUM EXPOSED INDIVIDUALS FOR PHASES 2 AND 3 OPERATIONAL ACTIVITIES

	MEI Off-site Worker	**MEI Residence**
Location of MEI	Otay Mesa Generating Project	Kuebler Ranch Residence
Cancer Risk per One Million Persons Exposed	4.42	5.92
Exceed 10 in One Million Threshold?	**No**	**No**
Chronic Hazard Index	**0.38**	**0.06**
Exceed HI of One?	**No**	**No**
Acute Hazard Index	**0.29**	**0.15**
Exceed HI of 1	**No**	**No**

Source: HELIX 2020b
MEI = maximum exposed individuals

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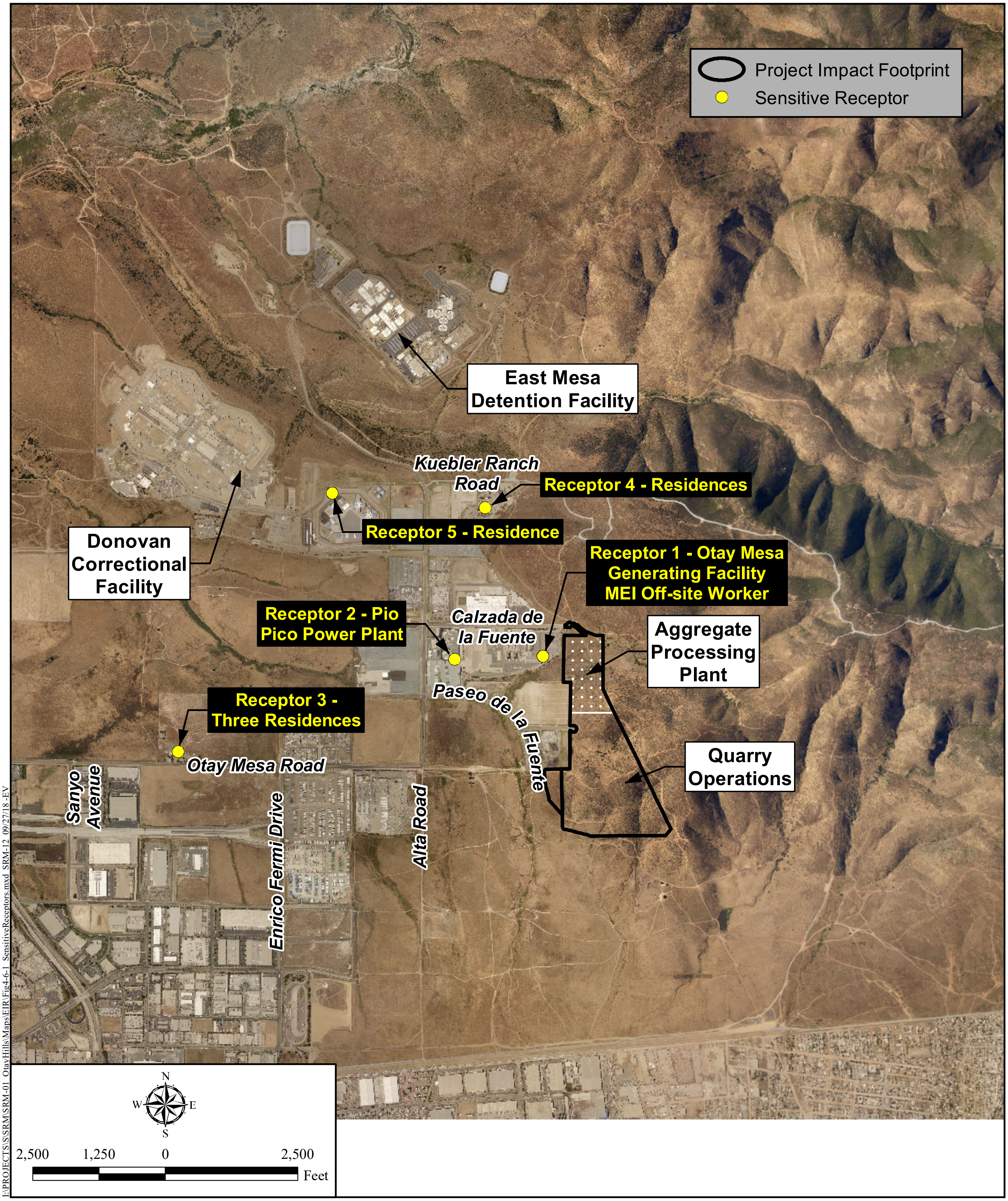

Location of Sensitive Receptors

OTAY HILLS EIR

HELIX Environmental Planning

Figure 4.6-1