3.13 Air Quality

This section of the Final Environmental Impact Report provides an overview of the existing air quality in the proposed Eagle Mountain Pump Storage Project (Project) area, associated regulatory framework, and an analysis of potential air quality impacts that could result from the short-term construction and long-term operation of the proposed Project.

3.13.1 Regulatory Setting

Air quality issues associated with the proposed Project are under the jurisdiction of the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the South Coast Air Quality Management District (SCAQMD).

Regulation of air pollution is achieved through both federal and state ambient air quality standards and emission limits for individual sources of air pollutants. An "ambient air quality standard" represents a level of an air pollutant in the outdoor (ambient) air that is deemed necessary to protect public health. The ambient standards do not apply to indoor environments.

3.13.1.1 Federal

The EPA has established National Ambient Air Quality Standards (NAAQS) for outdoor concentrations of the following "criteria" pollutants: carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), sulfur dioxide (SO2), lead (Pb), and particulate matter with aerodynamic diameters of 10 or 2.5 microns and less (PM10 and PM2.5).

An ambient air quality standard establishes the concentration above which the pollutant is known to cause adverse health effects to sensitive groups within the population such as children and the elderly. The goal is for localized Project effects not to cause or contribute to an exceedance of the standards. Ambient air quality standards are classified as either "primary" or "secondary" standards. Primary standards define levels of air quality, including an adequate margin of safety, necessary to protect the public health. Secondary ambient air quality standards define levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Under the Federal Clean Air Act (CAA), each state must identify non-attainment areas that do not meet the NAAQS. For any non-attainment designation, a State Implementation Plan (SIP) is developed to define actions to be taken to achieve attainment of the applicable NAAQS. In summary:

- An attainment area is any area that meets the NAAQS
- A non-attainment area is any area that does not meet the NAAQS
- A maintenance area is any area previously designated non-attainment but is in transition back to attainment

General Conformity is the federal process used to ensure that the air quality effects of federal actions not related to motor vehicle transportation plans are also considered in the air quality planning of nonattainment and maintenance areas. The criteria for determining the conformity of such actions to the Clean Air Act states that a conformity determination must be performed when:

- The emissions caused by a federal action equal or exceed the de minimis levels
- The emissions level is determined to be regionally significant, representing 10 percent or more of the applicable regional (or nonattainment area) emissions

If emissions are below the de minimis levels and the emissions are not regionally significant the action is presumed to conform to the CAA. If emissions exceed the de minimis levels or are regionally significant, a General Conformity Determination must be prepared.

The area surrounding the proposed Project is currently designated as attainment/unclassified for all NAAQS including the eight-hour O_3 standard, PM_{10}, and $PM_{2.5}$, although it is nonattainment for the California AAQS for ozone and PM_{10}.[1] Thus, General Conformity is not applicable and a General Conformity Determination is not required for this proposed Project.

Section 111 of the California Ambient Air (CAA) Standards of Performance of New Stationary Sources requires the EPA to establish federal emission standards for source categories that cause or contribute significantly to air pollution. These standards are intended to promote use of the best air pollution control technologies, taking into account the cost of such technology and any other non-air quality, health, and environmental impact and energy requirements.

Prevention of Significant Deterioration (PSD) regulations were first promulgated by the EPA (40 C.F.R. part 52) to prevent air quality degradation in those areas where criteria air pollutant concentrations are below the ambient standards (i.e., attainment areas). Exceedance of a PSD trigger level requires a demonstration by pollutant dispersion modeling that the emissions will not interfere with the attainment or maintenance of any NAAQS at the point of maximum impact and will not cause an exceedance of a PSD increment.

Title V of the 1990 CAA Amendments requires all major sources and some minor sources of air pollution to obtain an operating permit. A Title V permit grants a source permission to operate. The permit includes all air pollution requirements that apply to the source, including emissions limits and monitoring, record keeping, and reporting requirements. It also requires that the source report its compliance status with respect to permit conditions to the permitting authority. Under Title V of the CAA, any source that emits or has the potential to emit 100 tons per year or more of any criteria air pollutant is a major source and must obtain a Title V operating permit.

[1] California Area Designation Maps / state and Federal, http://www.arb.ca.gov/desig/adm/adm.htm

3.13.1.2 State

The CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county and regional Air Pollution Control Districts and Air Quality Management Districts. CARB regulates local air quality indirectly by establishing state ambient air quality standards and vehicle emissions and fuel standards, and by conducting research, planning, and coordinating activities. California has adopted ambient standards (CAAQS) that are more stringent than the federal standards for some criteria air pollutants.

3.13.1.3 Regional

The proposed Project is located in a portion of eastern Riverside County, which is within the Mojave Desert Air Basin (MDAB). The MDAB is comprised of four air districts, the Kern County Air Pollution Control District (APCD), the Antelope Valley Air Quality Management District (AQMD), the Mojave Desert AQMD, and the eastern portion of the South Coast AQMD. The Kern County APCD consists of the eastern portion of Kern County; the Antelope Valley AQMD consists of the northeastern portion of Los Angeles County; the Mojave Desert AQMD includes San Bernardino County and the most eastern portion of Riverside County; and the portion of the SCAQMD includes the eastern part of Riverside County.

The proposed Project (including the pipeline and transmission line elements) is located in a portion of eastern Riverside County that is within the SCAQMD jurisdiction. The SCAQMD also acts as the primary reviewing agency for environmental documents addressing potential air quality impacts, and develops regulations that must be consistent with, or more stringent than, federal and state air quality policies.

The SCAQMD is responsible for developing attainment plans for the region for inclusion in California's SIP, as well as establishing and enforcing air pollution control rules and regulations. The attainment plans must demonstrate compliance with federal and state ambient air quality standards, and must first be approved by CARB before inclusion into the SIP. The SCAQMD regulates, permits, and inspects stationary sources of air pollution, while the state is responsible for emission standards and controlling actual tailpipe emissions from motor vehicles. For this proposed Project, the relevant rules and regulations include:

- Rule 402 – requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off-site
- Rule 403 – requires use of best available technologies to reduce the amount of particulate matter (dust) entrained in ambient air as a result of anthropogenic (human-made, e.g., construction) activities

3.13.2 Existing Conditions

3.13.2.1 Climate and Meteorology

The primary factors that determine air quality are the locations of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions are also important. Factors such as wind speed and direction, and air temperature gradients interacting with physical landscape features determine the movement and dispersal of criteria air pollutants.

The MDAB consists of an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains that dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are generally out of the west and southwest, due to the proximity of the MDAB to coastal and central regions and the interference of the Sierra Nevada Mountains to the north. Air masses pushed onshore in southern California by differential heating are channeled through the MDAB.

Eastern Riverside County's climate is typical of an arid region, with hot, dry summers and mild, dry winters. Average maximum daily temperatures typically exceed 100 degrees Fahrenheit (°F) from June through September. Average annual precipitation varies from almost 0 to 9 inches per year, with a mean of approximately 3.94 inches. The MDAB is classified as a dry-hot desert climate (specifically: "tropical or subtropical desert: warm and arid [very dry] year-round") with portions classified as dry-very hot desert, to indicate that at least three months have maximum average temperatures over 100 °F.

Wind patterns in the area of the Project site are presented from data collected at the Southern California Edison meteorological station located near the southwestern edge of Blythe (Figure 3.13-1). The wind rose is for the 5-year distribution of wind velocity. A bi-modal wind direction distribution is apparent for the summary with maxima from the northeast and southwest. This bi-modal circulation pattern is influenced primarily by the southwest-northeast orientation of the nearby Colorado River Valley. This pattern is highly variable seasonally.

Criteria Air Pollutants. The following provides a brief summary of the potential health and welfare effects and typical sources of each of the criteria air pollutants (*see* Table 3.13-1 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) and nitrogen oxides (NO_x). VOCs and NO_x are known as precursor compounds for ozone. Substantial ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately 3 hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of VOC 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 air subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds.

Carbon Monoxide. Carbon monoxide (CO) is a non-reactive pollutant that is a product of incomplete combustion of organic material, and is mostly associated with motor vehicle traffic, and in wintertime, with wood-burning stoves and fireplaces. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces its oxygen-carrying capacity, resulting in reduced levels of oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California, but in more recent years CO measurements and modeling are not a priority in most California air districts due to the retirement of older polluting vehicles, less emission 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,* shown below:

> The dramatic reduction in CO levels across California is one of the biggest success stories in air pollution control. CARB 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 nonattainment 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 ederal 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.

Table 3.13-1. Criteria Air Pollutants

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 Hour 8 Hour	0.09 ppm 0.07 ppm	– 0.075 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases and nitrogen oxides react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide (CO)	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide (NO_2)	1 Hour Annual	0.18 ppm 0.03 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide (SO_2)	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM10)	24 Hour Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 –	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter (PM2.5)	24 Hour Annual	– 12 µg/m^3	35 µg/m^3 15 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including nitrogen oxides, sulfur oxides, and organics.
Lead (Pb)	Month Quarter	1.5 µg/m^3 –	– 1.5 µg/m^3	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present sources: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

SOURCE: California Air Resource Board, February 2, 2007, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

ppm = parts per million; µg/m^3 = micrograms per cubic meter

Nitrogen Oxides. When combustion temperatures are extremely high, as in aircraft, truck, and automobile engines, atmospheric nitrogen combines with oxygen to form various oxides of nitrogen. Nitric oxide (NO) and nitrogen dioxide (NO_2) are the most significant air pollutants generally referred to as NO_x. Nitric oxide is a colorless and odorless gas that is relatively harmless to humans, quickly converts to NO_2 and can be measured. Nitrogen dioxide has been found to be a lung irritant capable of producing pulmonary edema. Inhaling NO_2 can lead to respiratory illnesses such as bronchitis and pneumonia.

Particulate Matter. Particulate matter (PM_{10} and $PM_{2.5}$) consists of airborne particles that measure 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs, causing adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, wood burning stoves and fireplaces, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition, construction activities, and mining, are more local in nature, while others, such as vehicular traffic and wood burning stoves and fireplaces, have a more regional effect.

Very small particles 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 can also damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is easily filtered by human breathing passages. This dust is of concern more as a soiling nuisance rather than a health hazard. The remaining fractions, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and state ambient air quality standards. $PM_{2.5}$ (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.

Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Mortality studies 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 PM_{10} could reduce premature mortality rates by 6,500 cases per year.

Sulfur Dioxide. Sulfur dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter, and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. The maximum SO_2 concentrations recorded in the Project area are well below federal and state standards; as a result the area is in attainment status with both federal and state SO_2 standards.

Lead. Ambient lead concentrations meet both the federal and state standards in the Project area. Lead has a range of adverse neurotoxin health effects, and was released into the atmosphere via leaded gasoline products. The phase-out of leaded gasoline in California has resulted in dramatically decreased levels of atmospheric lead.

3.13.2.2 Existing Ambient Air Quality

The CARB, SCAQMD, and MDAQMD provide air quality monitoring networks with information on existing ambient concentrations of criteria air pollutants near the Project area. Monitored ambient air pollutant concentrations reflect the number and strength of emissions sources, the influence of topographical and meteorological factors, and determine attainment status. Table 3.13-2 Air Quality Data Summary presents a 5-year summary of air pollutant (concentration) data collected at the monitoring stations in the vicinity of the Project area. However, less monitoring data is available for the sparsely populated eastern Riverside County. For example, no PM_{10} and $PM_{2.5}$ monitors are located within the SCAQMD portion of the Mojave Desert Air Basin.

The pollutant concentrations are generally a conservative (overestimation) representation of background air pollutant concentrations at the Project area, because they are the highest 1-hour averages in many cases. However, background concentrations can vary among different locations within an area. Table 3.13-4 Annual Construction Emissions (below) compares these measured air pollutant concentrations with CAAQS and NAAQS. From the available data, some monitoring data does not meet applicable standards.

Table 3.13-2. Air Quality Data Summary (2004-2008)[1]

Pollutant	Monitoring Data by Year					
	CAAQS/ NAAQS[2]	**2004**	**2005**	**2006**	**2007**	**2008**
Ozone						
Highest 1 Hour Average (ppm) [3]	0.09/-	0.078	0.084	0.078	0.092	0.074
Days of Exceedance		0	0	0	0	0
Highest 8 Hour Average (ppm) [3]	0.07/0.075	0.068	**0.072**	0.059	**0.076**	**0.071**
Days of Exceedance		0	1	0	1	1
Particulate Matter (PM10)						
Highest 24 Hour Average (μg/m³) [3]	50/150	41	**53**	**53**	**88**	**72**
Days of Exceedance		0	5.8	na	24.5	Na
Annual Average (μg/m³) [3]	20/-	**28.4**	**25.8**	**27.6**	**29.3**	**25.1**
Particulate Matter (PM2.5)						
Highest 24 Hour Average (μg/m³) [3]	-/35	34	27	22	28	13

Days of Exceedance		0	0	0	0	0
Annual Average (µg/m^3)[3]	12/15	**10.8**	**9.6**	**10.3**	**9.7**	**Na**
Carbon Monoxide (CO)						
Highest 1 Hour Average (ppm)[3]	20/35	2.1	2.1	2.3	1.5	1.0
Highest 8 Hour Average (ppm)[3]	9/9	0.8	0.8	0.9	0.8	0.5
Nitrogen Dioxide (NO2)						
Highest 1 Hour Average (ppm)[3]	0.18/-	0.089	0.073	0.107	0.079	0.065
Annual Average (ppm)[3]	0.03/0.053	0.017	0.016	0.016	0.016	0.013

SOURCE: EPA (http://www.epa.gov/air/data/), 2004-2008 and CARB Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html), 2004-2008.

NOTE: Values in **bold** are in excess of applicable standard.
[1] Ambient monitoring station for ozone at 445 West Murphy Street, Blythe, for PM10 at Olive Street, Hesperia, and for PM2.5 at 14306 Park Avenue, Victorville, for NOx at 220 South Hathaway Street, Banning, and for CO at 590 Racquet Club Ave at Palms Springs.
[2] California Ambient Air Quality Standards are not to be exceeded and National Ambient Air Quality Standards are not to be exceeded more than once per year.
[3] ppm = parts per million; µg/m3 = micrograms per cubic meter.

Sensitive Receptors. For the purposes of air quality analyses, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from dust and air pollutant concentrations with Project construction and/or operation. These receptors generally include schools, day care centers, libraries, hospitals, residential care centers, parks, and churches. Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants.

Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than is the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

The mostly vacated town of Eagle Mountain is a 460-acre townsite, fenced with controlled access. The townsite is accessed by Kaiser Road, a two-lane county maintained roadway that will also provide access to the proposed Project. Numerous dirt roads intersect Kaiser Road, leading to scattered residences and agricultural fields.

The two small communities of Lake Tamarisk and Desert Center are located approximately 9 and 10 miles southeast of the Central Project Area. Lake Tamarisk consists of approximately 70 single family dwellings, an executive (9-hole) golf course, a recreational vehicle park, 150 undeveloped lots, and two small lakes.

Desert Center is located at the junction of Interstate 10 and State Route 177. Desert Center consists of a few small single-family dwellings, a mini-market, café, and bar. The community included gas stations at one time, but those are now closed. Public facilities include a county fire station, branch library, post office, and several churches.

The Project site is 1 and 1.5 miles from the southeastern boundary of Joshua Tree National Park (JTNP) at its nearest point and about 30 miles from the more developed sections of the JTNP. National Parks are designated as a Class I areas, and afforded protection through the federal PSD Program. Visibility and air concentrations due to fugitive dust emissions during construction are the main issue for air quality.

3.13.3 Potential Environmental Impacts

3.13.3.1 Methodology

The air quality analysis was conducted in accordance with published guidance, including the SCAQMD's *California Environmental Quality Act (CEQA) Air Quality Handbook*, BLM *NEPA Handbook H-1790-1*, FERC guidance: *Preparing Environmental Documents (Sept 2008)*, and *NEPA Procedures in FERC Hydroelectric Licensing (May 2000).*

Emissions associated with construction activities are temporary and variable depending on Project location, duration, and level of activity. These emissions occur predominantly from the exhaust generated from the operation of construction equipment, but can also be attributed to fugitive dust ($PM_{2.5}$ and PM_{10}) produced from materials staging, demolition, and earthworks activities, as well as concrete processing operations.

Construction equipment utilized in the proposed Project involve both on-road and non-road equipment. The former category of vehicles are used for the transport and delivery of supplies, materials and equipment to and from the site, and also include employee vehicles; the latter category of vehicles are operated exclusively on-site for the completion of activities such as paving, utility installation, site clearing and fill operations, earth moving, earth loading and unloading, installation of structures, and tunnel boring.

Activity levels and vehicle assignments for non-road and on-road construction vehicles were developed based on requirements and schedules outlined below. Non-road exhaust emissions factors were calculated using the current version of the CARB OFFROAD2007 model,[2] while on-road emissions factors were computed using county-specific data processed by the CARB EMFAC2007 model.[3] A detailed list of construction equipment assignments, projects,

[2] CARB OFFROAD2007 Emissions Model http://www.arb.ca.gov/msei/offroad/offroad.htm
[3] CARB EMFAC2007 Emissions Model, http://www.arb.ca.gov/msei/onroad/latest_version.htm

assumptions, usage schedules and emissions factors are compiled in Section 12.10 of this document.

Emissions factors used to estimate fugitive dust PM emissions from soil disturbance, wind erosion of stockpiles, traffic on unpaved surfaces, blasting, and demolition were obtained from the SCAQMD's CEQA Air Quality Handbook, EPA's *Compilation of Air Pollution Emissions Factors* (i.e., AP-42), and other accepted guidance, assuming a 75 percent control efficiency through implementation of mitigation techniques pertaining to fugitive dust and combustion emissions.

3.13.3.2 Thresholds of Significance

The proposed Project is located in the state of California, and therefore the significance of potential impacts to air quality is determined based on CEQA guidelines (CCR §§ 15000-15387, Appendix G), SCAQMD thresholds for criteria pollutants and other relevant considerations. These guidelines identify certain thresholds that may be pertinent in determining whether an impact is significant. Using these thresholds, the proposed Project would be considered to have significant air quality impacts if it were to:

(a) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable federal or state AAQS (including releasing emissions which exceed quantitative thresholds for ozone precursors).

(b) Expose sensitive receptors to substantial pollutant concentrations.

(c) Create objectionable odors affecting a substantial number of people.

With respect to criteria pollutants, SCAQMD provides quantitative guidance regarding significance thresholds for both construction and operational activities. These significance thresholds, listed in pounds per day (lb/day), are presented in Table 3.13-3 SCAQMD Significance Thresholds for construction and operations.

Table 3.13-3. SCAQMD Significance Thresholds (pounds per day)

Source	ROG	NOx	CO	PM10	PM2.5	SOx
Construction	75	100	550	150	55	150
Operation	55	55	550	150	55	150

Source: South Coast Air Quality Management District, *SCAQMD Air Quality Significance Thresholds*, October 2006, http://www.aqmd.gov/ceqa/hdbk.html

3.13.3.3 Environmental Impact Assessment

3.13.3.3.1 *Annual Emissions during Construction*

Construction-related annual emissions associated with the proposed Project are presented, segregated by Project year and pollutant type, in Table 3.13-4 Annual Construction Emissions. Annual emissions related to construction activities are highest in Year 2 or Year 3 (depending on pollutant) and are estimated to be 60.2 tons per year (tpy) for CO, 7.86 tpy for VOC, 56.7 tpy for NOx, 0.09 tpy for SO_2, 13.9 tpy for PM_{10} and 5.17 tpy for $PM_{2.5}$. The proposed Project represents less than a 10^{th} of 1 percent (0.07%) of the forecasted annual NOx emissions within the Mojave Desert Air Basin.

Table 3.13-4. Annual Construction Emissions (tons)

Year	CO	VOC	NO_X	PM_{10}	$PM_{2.5}$	SO_2	CO_2	N_2O	CH_4
Year 1	59.0	7.46	54.2	13.8	5.08	0.08	7,998	0.05	0.68
Year 2	57.7	7.86	56.7	13.9	5.17	0.09	9,021	0.05	0.71
Year 3	60.2	7.67	50.9	13.8	5.02	0.09	9,296	0.07	0.71
Year 4	15.8	1.66	9.61	11.6	3.08	0.02	1,931	0.02	0.15
Maximum	60.2	7.86	56.7	13.9	5.17	0.09	9,296	0.07	0.71
Percent of Mojave Desert Air Basin	0.04%	0.02%	0.07%	0.02%	0.03%	0.004%			

Source: Prepared by KB Environmental Sciences, Inc., 2009 (see Air Quality Appendix).

3.13.3.3.2 *Daily Emissions during Construction*

Construction-related daily emissions associated with the proposed Project are presented, segregated by Project year and pollutant type, in Table 3.13-5 Daily Construction Emissions. Typical daily emissions related to construction activities are highest in 2013 or 2014 (depending on pollutant) and are estimated to be less than: 463 pounds per day (ppd) for CO; 60.5 ppd for VOC; 436 ppd for NO_x; 0.73 ppd for SO_2; 107 ppd for PM_{10}; and 39.8 ppd for $PM_{2.5}$.

Table 3.13-5. Daily Construction Emissions (pounds)

Year	CO	VOC	NO_X	PM_{10}	$PM_{2.5}$	SO_2
Year 1	454	57.4	417	106	39.0	0.62
Year 2	444	60.5	436	107	39.8	0.70
Year 3	463	59.0	392	106	38.6	0.73
Year 4	122	12.8	74.0	89.3	23.7	0.16
Maximum	463	60.5	436	107	39.8	0.73
CEQA Threshold	550	75	100	150	55	150
Exceed CEQA	No	No	Yes	No	No	No

Source: KB Environmental Sciences, Inc., 2009.

Daily emissions are less than the SCAQMD CEQA thresholds for all pollutants except NO_x where the threshold is 100 ppd.

3.13.3.3.3 *Emissions during Operation*

Operation-related annual emissions associated with the proposed Project are presented in Table 3.13-6.

Table 3.13-6. Annual Operational Emissions (tons)

CO	VOC	NO_X	PM_{10}	$PM_{2.5}$	SO_2	CO_2	N_2O	CH_4
1.85	0.05	0.16	0.03	0.02	0.00	332	0.01	0.02

Source: Prepared by KB Environmental Sciences, Inc., 2009.

Air pollutant emissions associated with O&M activities (employee, delivery vehicle trips and miscellaneous area sources) would be minimal and would not exceed SCAQMD significance thresholds for operations.

3.13.3.3.4 *Reduction of Off-site Emissions*

One of the unique factors of pumped storage is flexibility of the timing to generate electricity and refill the Upper Reservoir. In addition to financial advantages that can be achieved by the timing, there are also environmental benefits related to the reduced emission profile of the power generated during off-peak periods. Table 3.13-7 Annual Offset Electrical Generation Air Emissions shows that even though it takes more pump-back power than the power that is generated by the facility, the overall emissions of criteria pollutants will be reduced by the overall system operation. Due to the nature of the grid, it is not know which power plants would be used for pump-back power or which power plants would be displaced by generation from the Eagle Mountain Pumped Storage Project. Table 3.13-7 looks at two scenarios for maximum and minimum displacement scenarios. The emissions from simple cycle power plants are assumed to be displaced in both the maximum and minimum displacement scenarios. The difference in the scenarios is that pump-back power is assumed to be generated by renewable sources (generating no air pollutants) in the maximum scenarios and combined cycle power plants are assumed to be displaced in the minimum displacement scenarios.

In most cases, the pump-back power would probably include a mix of power from the combined cycle power plants and the renewable sources so the actual emissions displaced would fall between the maximum and minimum displaced amounts shown. As shown in Table 3.13-7, the proposed Project would be expected to have a net benefit for the state with regard to the generation of air pollutant emissions. The proposed Project power generation would reduce reliance on simple cycle power plants (displacing their air pollutant emissions) during peak periods of electricity demand and rely on cleaner power plants for pump-back power during periods of low electricity demand.

During peak periods, approximately 1,300 megawatts (MW) would be available for use. In this manner, the proposed Project would eliminate the need for the regional transmission operator (California ISO) to dispatch up to 1,300 MW of fossil-fueled peaking plants (or increase capacity from baseline plants typically powered by natural gas) during peak periods, and thus eliminate the criteria air pollutant and greenhouse gas emissions associated with the fossil-fueled facilities.

Of important note, there are beneficial synergies between a pumped storage development and non-firm energy from wind and, potentially, solar projects. More than 2,000 MW of wind power have been built in California, and more capacity is planned. The San Gorgonio Pass area of central Riverside County has 359 MW of wind generation capacity. This area is less than 100 miles from the Project. There are also eight solar projects now planned for the Chuckwalla Valley, one within 5 miles of the Project, with over 1,000 MW estimated total capacity proposed.

Wind power is only generated when the wind is blowing, and that does not always correspond to times of power demand. “Control power” is needed for times of high wind when the electrical grid cannot absorb the excessive power, and energy should be stored for times of insufficient wind.

Pumped hydropower stores energy by using surplus power for pumping water from a lower level to a higher level. Thus, the proposed Project can serve as a “battery” for energy generation. In addition, energy generation from pumped storage can be rapidly adjusted to match demand, enhancing the overall reliability of the transmission system. These benefits result in a substantial benefit towards air quality impacts and climate change.

The proposed Project would displace the need for up to 1,300 MW of fossil-fueled peaking plants during peak periods.

Table 3.13-7 Annual Offset Electrical Generation Air Emissions (tons)

	Power Source		NOx	VOC	CO	PM10	SOx
Pump-back Power Used	Renewable Sources	GWh/Year (20% annual hours)	2,883	2,883	2,883	2,883	2,883
		Emission Factor (lbs/GWh))	0	0	0	0	0
	[A]	Annual Pollutants (tons)	0	0	0	0	0
	Combined Cycle	GWh/Year (20% annual hours)	2,883	2,883	2,883	2,883	2,883
		Emission Factor (lbs/GWh))	70	21	24	37	5
	[B]	Annual Pollutants (tons)	101	30	35	53	7
Generation Displaced	Simple Cycle	GWh/Year (20% annual hours)	2,278	2,278	2,278	2,278	2,278
		Emission Factor (lbs/GWh))	279	54	368	134	13
	[C]	Annual Pollutants (tons)	318	61	419	153	15
Summary of Displaced Emissions							
		Maximum Displaced Net Emissions Rows [C] - [A] (tons)	318	61	419	153	15
		Minimum Displaced Net Emissions Rows [C] - [B] (tons)	217	31	384	99	8

Notes: These emissions have been calculated using emissions factors from Comparative Costs of California Central Station Electricity Generation (CEC, 2010) for conventional simple cycle and combined cycle power plants. The analysis assumes 2,278 GWh of annual generation for the project (1.3 MW for 20% of the annual hours). The pump-back efficiency is 79%, resulting in more GWh/year required for the pump-back power requirements than are generated annually. Different amounts of annual generation would have directly proportional benefits of displacing the air emissions shown in this table.

Environmental Impact Assessment Summary:

(a) *Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state AAQS (including releasing emissions which exceed quantitative thresholds for ozone precursors)?* Yes. The proposed Project alone would result in a *significant construction-related impact* from NOx in construction years 2012 through 2014. If a project would individually have a significant air quality impact, the Project would also be considered to have a *significant cumulative air quality impact.*

(b) *Would the project expose sensitive receptors to substantial pollutant concentrations?* No. The Project does not have the potential to emit substantial pollutants. In addition, the closest sensitive receptors [Lake Tamarisk and Desert Center communities] are located approximately 9 and 10 miles southeast of the Central Project Area, and approximately 1 to 1.5 miles from the southeastern boundary of JTNP at its nearest point and about 30 miles from the more developed sections of the JTNP.

(c) *Would the project create objectionable odors affecting a substantial number of people?* No. (*See* response (b) above).

Impact 3.13-1 Annual Emissions during Construction. The proposed Project represents less than 0.07 percent of the forecasted annual NOx emissions within the Mojave Desert Air Basin. This impact is *less than significant*.

Impact 3.13-2 Daily Emissions during Construction. These emissions are less than the SCAQMD CEQA thresholds for all pollutants except NO_x where the threshold is 100 ppd; therefore, the NO_x impact is *potentially significant and subject to the mitigation program* (MM AQ-1 through MM AQ-13).

Impact 3.13-3 Emissions during Operation. Air pollutant emissions associated with O&M activities (employee, delivery vehicle trips, and miscellaneous area sources) would be minimal and would not exceed SCAQMD significance thresholds for operation. This impact is *less than significant*.

3.13.4 Mitigation Program

The mitigation program includes project design features (PDFs) and mitigation measures (MMs), where applicable. Project design features are design elements inherent to the Project that reduce or eliminate potential impacts. Mitigation measures are provided to reduce impacts from the proposed Project to below a level of significance, where applicable. As appropriate, performance standards built have been into mitigation measures.

As mentioned under Regulatory Settings, LORS are based on local, state, or federal regulations or laws that are frequently required independent of CEQA review, yet also serve to offset or prevent certain impacts. The proposed Project will be constructed and operated in conformance with all applicable federal, state, and local LORS.

To construct necessary features of the Project there will be fugitive dust sources from grading, trenching, wind erosion, and truck filling/dumping at the site. Applicable mitigation measures of AQ-1 through AQ-5, derived from SCAQMD Rule 403 and Rule 402, to reduce fugitive dust impacts are identified.

MM AQ-1. **Fugitive Dust.** Periodic watering or application of suitable surfactant will be conducted for short-term stabilization of disturbed surface areas and storage piles as needed to minimize visible fugitive dust emissions. For dirt roads, watering, with complete coverage, shall occur at least twice daily, preferably in the late morning and after work is done for the day.

MM AQ-2. **Trackout.** To prevent Project-related trackout onto paved surfaces, the following measures will be undertaken through the construction period:

- Prevention and clean-up of Project-related track out or spills on publicly maintained paved surfaces within 24 hours
- Covering loaded haul vehicles operating on public paved roads
- Material transported off-site shall be either sufficiently watered or securely covered to prevent excessive amounts of dust
- Paving, gravel covering, or chemically stabilizing on-site roads as soon as feasible
- Limiting on-site vehicle speeds on unpaved surfaces to 25 miles per hour (mph)
- Operating a wash rack for drivers to wet down material before leaving the facility
- Operate a wheel washer (or equivalent) to remove soil from vehicle tires as needed

MM AQ-3. **Grading.** Graded site surfaces will be stabilized upon completion of grading when subsequent development is delayed or expected to be delayed more than 30 days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions.

MM AQ-4. **Surface Disturbance.** Areas of active surface disturbance (such as grading) will be limited to no more than 15 acres per day.

MM AQ-5. **Earth-moving Activities.** Non-essential earth-moving activities will be reduced during windy conditions; i.e., when visible dusting occurs from moist and dry surfaces due to wind erosion. Clearing, grading, earth-moving, or excavation activities will cease if winds exceed 25 mph averaged over 1-hour duration.

In addition, compliance with MM AQ-6 through AQ-12 would further reduce impacts from engine exhaust and NOx and other criteria pollutant emissions.

MM AQ-6. **Transportation Management Plan.** The Licensee shall be responsible to develop and implement a Transportation Management Plan (TMP) for employees, including provisions for ridesharing, use of shuttle transit for Project employees, and provision of on-site food service to reduce vehicle trips, where feasible. The TMP shall also consider availability of local housing that can be secured for use by a voluntary portion of the employees throughout the construction period. The TMP will target a minimum 25% reduction in employee vehicle trips.

MM AQ-7. **Diesel Trucks.** All diesel truck operators shall strictly abide by the applicable state law requirements for idling, as described in the airborne toxic control measure (CCR, Title 13, section 2485), which limits vehicles with gross vehicular weight ratings of more than 10,000 pounds to no more than 5 minutes in a 60-minute period of idling of the primary engine or the diesel-fueled auxiliary power system at any location.

MM AQ-8. **Equipment.** Use electrical drops in place of temporary electrical generators, and substitute low- and zero emitting construction equipment and/or alternative fueled or catalyst equipped diesel construction equipment wherever economically feasible.

MM AQ-9. **Generators.** Electrical generators must be properly permitted with the SCAQMD.

MM AQ-10. **Heavy-duty Diesel Trucks.** Heavy-duty diesel trucks shall be properly tuned and maintained to manufacturers' specifications to ensure minimum emissions under normal operations.

MM AQ-11. **Construction Equipment.** At least 50 percent diesel fleet hours will utilize 2002 or later year diesel construction equipment, where feasible.

MM AQ-12. **Off-road Construction Equipment.** Older off-road construction equipment shall be retrofitted with appropriate emission control devices prior to on-site use.

MM AQ-13. **Air Quality Study Design.** The Licensee shall work collaboratively with the National Park Service (NPS) to establish an air quality study design for 2 years of ozone monitoring to be conducted upon completion of construction and Project operations beginning. The Licensee will fund the annual expenses as a cost-share with the NPS and other transmission operators. The funding contribution for this study will be based on a percentage of total miles of transmission line.

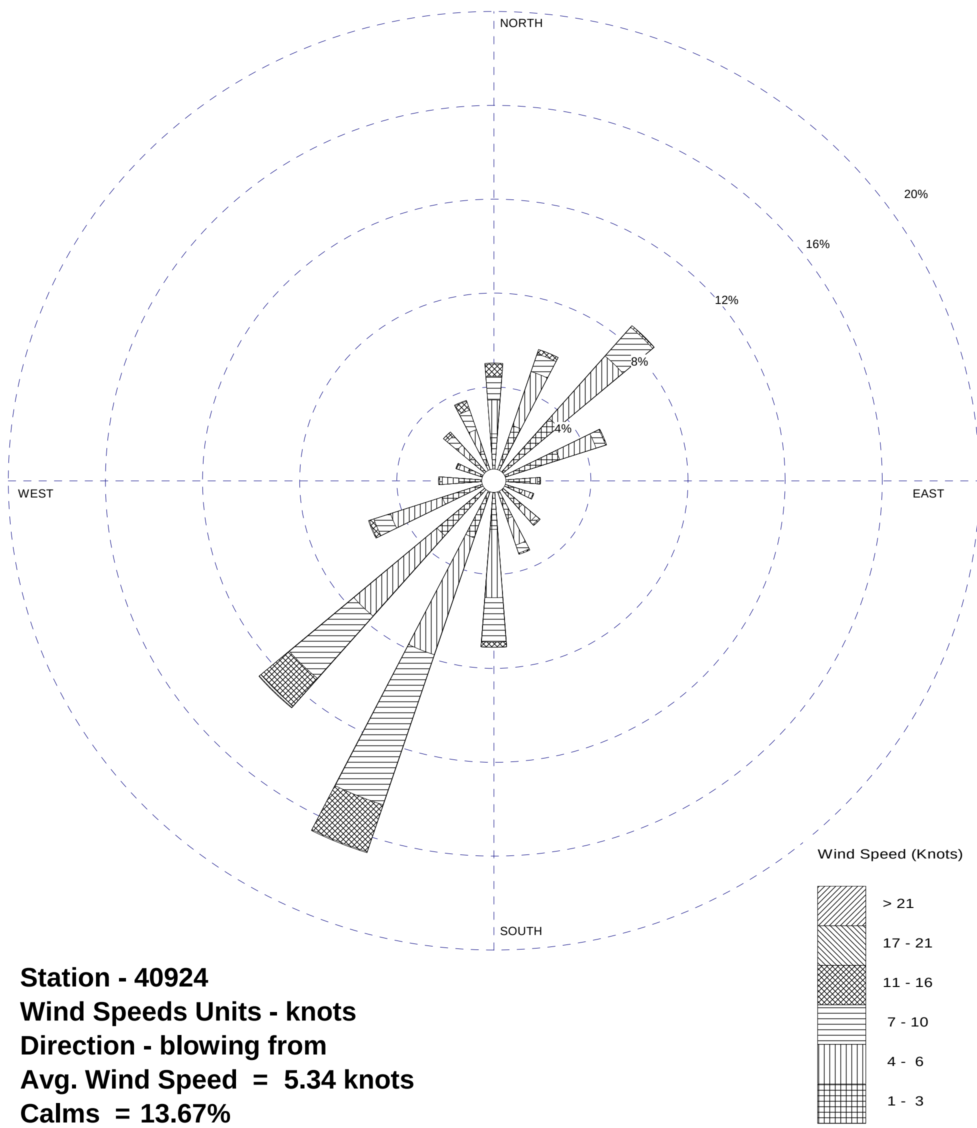
3.13.5 Level of Significance after Implementation of Mitigation Program

The proposed Project will result in a significant construction-related impact from NO_x in construction years 2012 through 2014. Other air quality parameters will not exceed the threshold of significance.

Impact 3.13-1 Annual Emissions during Construction. The proposed Project represents less than 0.07 percent of the forecasted annual NOx emissions within the Mojave Desert Air Basin.

Impact 3.13-2 Daily Emissions during Construction. These emissions are less than the SCAQMD CEQA thresholds for all pollutants except NO_x where the threshold is 100 ppd.

Impact 3.13-3 Emissions during Operation. Air pollutant emissions associated with operations and maintenance activities (employee, delivery vehicle trips and miscellaneous area sources) would be minimal and would not exceed SCAQMD significance thresholds for operation.



Station - 40924
Wind Speeds Units - knots
Direction - blowing from
Avg. Wind Speed = 5.34 knots
Calms = 13.67%

Figure 3.13-1. **Wind pattern in the project site.**
Source: Southern California Edison meteorological station in Blythe, CA; data collected from 1989 – 1993.