4.5 AIR QUALITY

This section discusses the environmental setting for air quality in the vicinity of the Proposed Project and analyzes the potential impacts to local and regional air quality due to the Proposed Project. The analysis will be completed for two air basins and air districts in southern California because SONGS Unit 1 and Oceanside are in San Diego County, Dana Point is in Orange County, and Long Beach is in Los Angeles County.

4.5.1 Description of Resource/Environmental Setting

Air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions that influence movement and dispersal of pollutants. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

This section describes the existing air quality environment in the vicinity of the Proposed Project and associated activities. This existing setting includes a description of the physical geography, climate, and meteorology of the South Coast Air Basin (SCAB) and the San Diego Air Basin (SDAB), a description of criteria air pollutants, and a short discussion of the potential health effects for each pollutant.

South Coast Air Basin

The SCAB includes all of Los Angeles and Orange counties, and the urbanized portions of San Bernardino and Riverside counties. The distinctive climate of the SCAB is determined by its terrain and geographic location. The SCAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the southwest and high mountains around the rest of its perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific (the Pacific High), resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds (SCAQMD 1993).

The vertical dispersion of air pollutants in the SCAB is hampered by the presence of persistent temperature inversions. High-pressure systems, such as the semi-permanent high-pressure zone in which the SCAB is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-

case conditions for the formation of photochemical smog. Throughout the SCAB, inversions occur at 3,500 feet (1,067 m) above mean sea level (AMSL) or less and average 191 days per year (SCAQMD 1993).

The atmospheric pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 miles per hour (mph), smog potential is greatly reduced within the SCAB.

San Diego Air Basin

The SDAB is contiguous with San Diego County. The climate of the SDAB is characterized by warm, dry summers and mild, wet winters. One of the main determinants of the climatology, as in the SCAQMD, is the Pacific High. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of California. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation.

As in the SCAB, the vertical dispersion of air pollutants in the SDAB is hampered by the presence of persistent temperature inversions. The subsidence inversions within the SDAB generally occur during the warmer months (May through October) as descending air associated with the Pacific high-pressure cell comes into contact with cool marine air. Within the SDAB, the inversion layer is approximately 2,000 feet (610 m) AMSL during the months of May through October. During the winter months (November through April), the temperature inversion rises to approximately 3,000 feet (914 m) AMSL. Inversion layers are important elements of local air quality because they inhibit the dispersion of pollutants, thus resulting in a temporary degradation of air quality. As in the SCAB, on days without inversions, or on days of winds averaging over 15 mph, smog potential is greatly reduced with the SDAB.

Criteria Air Pollutants

The following specific descriptions of health effects for each of the criteria air pollutants are based on information developed and promulgated by the EPA (EPA 2004a) and the California Air Resources Board (ARB) (ARB 2001).

Ozone. Ozone (O_3) is considered a photochemical oxidant, which is a chemical that is formed when volatile organic compounds (VOC) and nitrogen oxides (NO_X), both by-products of combustion, react in the presence of ultraviolet light. O_3 is considered a

respiratory irritant and prolonged exposure can reduce lung function, aggravate asthma, and increase susceptibility to respiratory infections. Children and those with existing respiratory diseases are at greatest risk from exposure to O_3.

Carbon monoxide. Carbon monoxide (CO) is a product of combustion, and the main source of CO in the SCAB and SDAB is from motor vehicle exhaust. CO is an odorless, colorless gas. CO affects red blood cells in the body by binding to hemoglobin and reducing the amount of oxygen that can be carried to the body's organs and tissues. CO can cause health effects to those with cardiovascular disease and can also affect mental alertness and vision.

Nitrogen dioxide. Nitrogen dioxide (NO_2) is also a by-product of fuel combustion and is formed both directly as a product of combustion and in the atmosphere through the reaction of nitric oxide with oxygen. NO_2 is a respiratory irritant and may affect those with existing respiratory illness, including asthma. NO_2 can also increase the risk of respiratory illness.

Particulate matter. Respirable particulate matter (PM_{10}) refers to particulate matter with an aerodynamic diameter of 10 microns or less. Fine particulate matter ($PM_{2.5}$) refers to particulate matter with an aerodynamic diameter of 2.5 microns or less. Particulate matter in this size range has been determined to have the potential to lodge in the lungs and contribute to respiratory problems. PM_{10} and $PM_{2.5}$ arise from a variety of sources, including road dust, diesel exhaust, combustion, tire and brake wear, construction operations, and windblown dust. PM_{10} and $PM_{2.5}$ can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases such as asthma and chronic bronchitis. $PM_{2.5}$ is considered to have the potential to lodge deeper in the lungs.

Sulfur dioxide. Sulfur dioxide (SO_2) is a colorless, reactive gas that is produced from the burning of sulfur-containing fuels such as coal and oil, and by other industrial processes. Generally, the highest concentrations of SO_2 are found near large industrial sources. SO_2 is a respiratory irritant that can cause narrowing of the airways leading to wheezing and shortness of breath. Long-term exposure to SO_2 can cause respiratory illness and aggravate existing cardiovascular disease.

Lead. Lead (Pb) in the atmosphere occurs as particulate matter. Pb has historically been emitted from vehicles combusting leaded gasoline, as well as from industrial sources. With the phase-out of leaded gasoline, large manufacturing facilities are the sources of the largest amounts of Pb emissions. Pb has the potential to cause

gastrointestinal, central nervous system, kidney, and blood diseases upon prolonged exposure. Pb is also classified as a probable human carcinogen.

Sulfates. Sulfates are the fully oxidized ionic form of sulfur. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels, e.g., gasoline and diesel fuel, that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features. The ARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardiopulmonary disease. Sulfates are particularly effective in degrading visibility and, because they are usually acidic, can harm ecosystems and damage materials and property.

Hydrogen Sulfide. Hydrogen sulfide (HS) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas and can be emitted as the result of geothermal energy exploitation. Breathing HS at levels above the standard will result in exposure to a very disagreeable odor. In 1984, an ARB committee concluded that the ambient standard for HS is adequate to protect public health and to significantly reduce odor annoyance.

Vinyl Chloride. Vinyl chloride, a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure to vinyl chloride through inhalation and oral exposure causes liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer in humans.

4.5.2 Regulatory Setting

Federal

The Federal Clean Air Act (CAA) (USC § 7401) requires the adoption of National Ambient Air Quality Standards (NAAQS) to protect the public health, safety, and welfare from known or anticipated effects of air pollution. The NAAQS have been updated

occasionally. Current standards are set for SO_2, CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb. These pollutants are collectively referred to as criteria pollutants.

Federal standards for 8-hour O_3 and $PM_{2.5}$ became effective on September 15, 1997, and were subsequently challenged and litigated. The U.S. Supreme Court affirmed the standards, and policies and systems to implement these new standards are being developed. Attainment designations for 8-hour O_3 were formally published on April 15, 2004, and designations for $PM_{2.5}$ were formally published on December 17, 2004 (ARB 2004b; EPA 2004b, 2004f).

The EPA has designated all areas of the United States as either "attainment," "nonattainment," or "unclassified" with respect to the NAAQS. An attainment designation means that the air quality of the area is better than the NAAQS. A nonattainment designation means that a primary NAAQS has been exceeded more than three separate times in 3 years in a given area. An area is designated as unclassified when sufficient data are not available to classify it as either attainment or nonattainment. If an area is redesignated from nonattainment to attainment, the CAA requires a revision to the State Implementation Plan (SIP), called a maintenance plan, to demonstrate how the air quality standard will be maintained for at least 10 years.

State

The ARB is the State agency with authority to enforce regulations to both achieve and maintain the NAAQS. The ARB has established additional standards, known as the California Ambient Air Quality Standards (CAAQS), which are generally more stringent than the NAAQS. Federal and State standards are shown in Table 4.5-1. The ARB is responsible for the development, adoption, and enforcement of the State's motor vehicle emissions program, as well as the adoption of the CAAQS. The ARB also reviews operations and programs of the local air districts and requires each air district with jurisdiction over a nonattainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations.

Table 4.5-1. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	Secondary[4]	Concentration[5]
Ozone (O_3)[6]	1-Hour	0.12 parts per million (ppm) (235 micrograms per cubic meter [µg/m^3])	Same as Primary Standard	0.09 ppm (180 µg/m^3)
	8-Hour	0.08 ppm		-
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 µg/m^3)	None	9.0 ppm (10 µg/m^3)
	1-Hour	35 ppm (40 µg/m^3)		20 ppm (23 µg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m^3)	Same as Primary Standard	-
	1-Hour	-		0.25 ppm (470 µg/m^3)
Sulfur Dioxide (SO_2)	Annual Average	80 µg/m^3 (0.03 ppm)	-	-
	24-Hour	365 µg/m^3 (0.14 ppm)	-	0.04 ppm (105 µg/m^3)
	3-Hour	-	1300 µg/m^3 (0.5 ppm)	-
	1-Hour	-	-	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM_{10})	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	50 µg/m^3		20 µg/m^3 note 7
Fine Particulate Matter ($PM_{2.5}$)[6]	24-Hour	65 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m^3		12 µg/m^3 note 7
Lead (Pb)	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (HS)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific Standard Time)			In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

[1] NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the USEPA for further clarification and current Federal policies.

[2] California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

[3] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[4] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[5] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C (77°F) and a reference pressure of 760 millimeters (mm) of mercury. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar). Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[6] New Federal 8-hour ozone and fine particulate matter standards were promulgated by USEPA on July 18, 1997. The Federal 1-hour O_3 standard continues to apply in areas that violated the standard. Contact USEPA for further clarification and current Federal policies.

[7] On June 5, 2003, the Office of Administrative Law approved the amendments to the regulations for the state ambient air quality standards for particulate matter and sulfates. Those amendments established a new annual average standard for $PM_{2.5}$ of 12 µg/m^{3}and reduced the level of the annual average standard for PM_{10} to 20 µg/m^3. The approved amendments were filed with the Secretary of State on June 5, 2003. The regulations became effective on July 5, 2003.

Source: CARB 2004a.

The ARB, similar to the EPA, designates areas as either “attainment” or “nonattainment” based on compliance or noncompliance with the CAAQS. The ARB considers an area to be in nonattainment if the CAAQS have been exceeded more than once in 3 years.

Local

South Coast Air Quality Management District (SCAQMD)

The SCAQMD is the agency responsible for the administration of Federal and State air quality laws, regulations, and policies within the SCAB. Included in the SCAQMD’s tasks are the monitoring of air pollution, the preparation of the SCAB portion of the SIP, and the promulgation of Rules and Regulations. The SIP includes strategies and tactics to be used to attain and maintain acceptable air quality in the county; the strategies identified in the SIP are taken from the SCAQMD Air Quality Management Plan (AQMP). SCAQMD regulations require that any equipment that emits or controls air contaminants, such as NO_x and VOC be permitted (Permit to Construct or Permit to Operate) prior to construction, installation, or operation. The SCAQMD is responsible for review of applications and for the approval and issuance of these permits.

San Diego Air Pollution Control District (SDAPCD)

The SDAPCD is the agency responsible for protecting the public health and welfare through the administration of Federal and State air quality laws and policies within the SDAB. Included in the SDAPCD’s tasks are the monitoring of air pollution, the preparation of the San Diego County portion of the SIP, and the promulgation of Rules and Regulations. The SIP includes strategies and tactics to be used to attain and maintain acceptable air quality in the county; this list of strategies is called the Regional Air Quality Strategies (RAQS). SDAPCD regulations require that any equipment that emits or controls air contaminants be permitted (Permit to Construct or Permit to Operate) prior to construction, installation, or operation. The SDAPCD is responsible for review of applications and for the approval and issuance of these permits.

Air Quality Plans

South Coast Air Quality Management District

The current Air Quality Plan in the SCAB is the 2003 AQMP, which is an update of the 1997 AQMP. The 2003 AQMP employs up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. The 2003 AQMP proposes policies and measures to achieve Federal and State standards for healthful air quality in the SCAB. The 2003 AQMP updates the demonstration of attainment with the Federal standards for O_3 and PM_{10}; replaces the 1997 attainment demonstration for the Federal CO standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the Federal NO_2 standard that the SCAB has met since 1992 (SCAQMD 2003). The 2003 AQMP was adopted by SCAQMD in August 2003 and approved, with modifications, by the ARB in October 2003 (ARB 2003). The EPA is reviewing the 2003 AQMP and approval is pending.

San Diego Air Pollution Control District

The current RAQS in the SDAB is the 2004 Triennial Revision of the RAQS (2004 RAQS), which is an update of the 2001 RAQS. The 2004 RAQS employ up-to-date science and analytical tools and incorporate a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. The 2004 RAQS contain an expeditious schedule for adopting every feasible emission control measure under the SDAPCD's purview to comply with the NAAQS and CAAQS O_3 standards (SDAPCD 2004a).

Existing Air Quality

Attainment Status

South Coast Air Basin

The Orange County portion of the SCAB is currently classified as a Federal and State nonattainment area for O_3, PM_{10}, and $PM_{2.5}$ and a Federal nonattainment area for CO. Orange County is classified as a State attainment area for CO. Specific O_3 nonattainment designations are "extreme" for the 1-hour O_3 standard and severe-17 for the 8-hour O_3 standard. The SCAB currently meets the Federal and State standards for NO_2, SO_2, and Pb and is classified as an attainment area for these pollutants (EPA 2004d).

On December 17, 2004, the EPA issued the initial designations for the $PM_{2.5}$ standard, and the SCAB is classified as nonattainment. States with nonattainment areas must submit plans by early 2008 that outline how they will meet the $PM_{2.5}$ standards. They are expected to attain clean air as soon as possible and not later than 2010. The EPA can grant one 5-year extension, to 2015, for areas with more severe problems (EPA 2004f).

San Diego Air Basin

The SDAB currently meets the Federal standards for all criteria pollutants except O_3 and $PM_{2.5}$ and meets State standards for all criteria pollutants except O_3, PM_{10}, and $PM_{2.5}$. The SDAB completed 3 years within the Federal 1-hour O_3 standard on November 15, 2001, becoming eligible for redesignation as an attainment area. Formal redesignation by the EPA as an O_3 attainment area occurred on July 28, 2003, and a maintenance plan was approved. On April 15, 2004, the EPA issued the initial designations for the 8-hour O_3 standard, and the SDAB is classified as "basic" nonattainment. Basic is the least severe of the six degrees of O_3 nonattainment. The SDAPCD must submit an air quality plan to the EPA in 2007; the plan must demonstrate how the 8-hour O_3 standard will be attained by 2009 (SDAPCD 2004b). The SDAB is currently classified as a State "serious" O_3 nonattainment area and a State nonattainment area for PM_{10}. The SDAB currently falls under a Federal "maintenance plan" for CO, following a 1998 redesignation as a CO attainment area.

On December 17, 2004, the EPA issued the initial designations for the $PM_{2.5}$ standard, and the SDAB is classified as nonattainment. States with nonattainment areas must submit plans by early 2008 that outline how they will meet the $PM_{2.5}$ standards. They are expected to attain clean air as soon as possible and not later than 2010. The EPA

can grant one 5-year extension, to 2015, for areas with more severe problems (EPA 2004f).

Ambient Air Quality Monitoring

As the primary sources of air emissions would be located in the SDAB (only the towing of the barges would occur within the SCAB), it is appropriate to use a monitoring station in the SDAB to characterize the existing air quality in the project area. Ambient air pollutant concentrations in the SDAB are measured at 10 air quality monitoring stations operated by the SDAPCD. The closest SDAPCD air quality monitoring station in the SDAB is the MCB Camp Pendleton monitoring station, located at 21441 West B St., Camp Pendleton, approximately 14 miles (23 km) southeast of the Proposed Project area. The station only monitors O_3 and NO_2. No other monitoring stations in the SDAB or SCAB are located near enough to the Proposed Project area to be used to characterize other criteria pollutants. Table 4.5-2 summarizes the excesses of standards and the highest pollutant levels recorded at this station for the years 1999 to 2003.

4.5.3 Significance Criteria

Criteria to determine the significance of air quality impacts are based on Federal, State, and local air pollution standards and regulations. The SCAQMD has established air pollution thresholds under the CEQA against which a proposed project can be evaluated and which assist lead agencies in determining whether a proposed project would produce significant air quality impacts. The SDAPCD does not have CEQA thresholds, Separate impact criteria have been established for both short-term construction and long-term operations. Impacts on air quality would be considered significant if project emissions, or emissions of any alternative: (1) would exceed thresholds used to determine the significance of proposed emissions for the purpose of the CEQA review, or (2) would cause an increase in ambient pollutant levels above national or State ambient air quality standards. The following summarizes the CEQA thresholds applicable to each affected air jurisdiction.

South Coast Air Quality Management District

Due to the short-term nature of the Proposed Project's activities, project emissions that would occur within the SCAB project region would be compared to the following SCAQMD construction emission thresholds (Table 4.5-3): (1) daily emissions of 75 pounds of reactive organic compounds (ROC), 100 pounds of NO_x, 150 pounds of

Table 4.5-2. Ambient Air Quality Summary, MCB Camp Pendleton

Pollutant	Averaging Time	California Air Quality Standards	Federal Primary Standards	Maximum Concentrations[1]					Number of Days Exceeding Federal Standard[2]					Number of Days Exceeding State Standard[2]				
				2000	2001	2002	2003	2004	2000	2001	2002	2003	2004	2000	2001	2002	2003	2004
Ozone	1 hour	0.09 ppm	0.12 ppm	0.109	0.113	0.87	0.099	0.110	0	0	0	0	0	2	2	0	4	2
	8 hour	None	0.08 ppm	0.099	0.098	0.073	0.084	0.089	2	1	0	0	1	–	–	–	–	–
Nitrogen Dioxide	1 hour	0.25 ppm	none	0.117	0.092	0.109	0.095	0.099	–	–	–	–	–	0	0	0	0	0
	Annual	none	0.053 ppm	0.014	0.013	0.013	0.012	–	0	0	0	0	0	–	–	–	–	–

"–" = data not available or applicable.

(1) Concentration units for O_3, CO, and NO_2 are in parts per million (ppm). Concentration units for PM_{10} are in micrograms per cubic meter ($\mu g/m^3$).

(2) For annual standards, a value of 1 indicates that the standard has been exceeded.

(3) Federal standard is annual arithmetic mean; state standard, through 2001, is annual geometric mean.

(4) $PM_{2.5}$ monitoring began in 1999. Standards and exceedances are based on 3-year averages. The 3-year averages have not been published, and the standard has not been implemented.

Source: CARB 2004a.

Table 4.5-3. SCAQMD CEQA Significance Thresholds - Construction

Pollutant	Emissions Threshold	
	Pounds/Day	Tons/Quarter
Volatile Organic Compounds	75	2.5
Oxides of Nitrogen	100	2.5
Oxides of Sulfur	150	6.75
Particulate Matter (PM_{10})	150	6.75
Carbon Monoxide	550	24.75

sulfur oxides (SO_x) or PM_{10}, or 550 pounds of CO; and (2) calendar quarter emissions of 2.5 tons of ROC or NO_x, 6.75 tons of SO_x or PM_{10}, or 24.75 tons of CO (SCAQMD 1993).

San Diego Air Pollution Control District

Neither the County of San Diego nor the SDAPCD have quantitative thresholds for determining significance of impact under the CEQA. On Federal projects in a Basic O_3 (8-hour) nonattainment area, thresholds for the presumption that a project would conform to the SIP are 100 tons per year for both NO_x and VOC. In recognition of State nonattainment for O_3 and to be conservative, thresholds of 50 tons per year for NO_x and VOC are used for this project. The Federal SIP conformity threshold for PM_{10} in a Federal nonattainment area is 100 tons per year. Although the SDAB is not a Federal nonattainment area for PM_{10}, it is a State nonattainment area as well as a Federal nonattainment area for $PM_{2.5}$. Therefore, the conservative threshold of 50 tons per year for PM_{10} is used for this project. For CO, as the SDAB is compliant with both State and Federal standards, the conformity threshold of 100 tons per year will be used to determine significance.

4.5.4 Impact Analysis and Mitigation

The Proposed Project includes the installation of conduit plugs and the removal of the manhole risers and terminal structures on the conduits for SONGS Unit 1. The Proposed Project may affect air quality in more than one air basin. Towing emissions would be generated primarily in the SCAB, as the barges would be towed from the Port of Long Beach and along the Orange County Coast, while the actual project activity would occur within the SDAB. The analysis includes air emissions that would be generated onshore and offshore, plus barging activities that would occur within the 12-nautical-mile U.S. Territorial Waters Boundary. To determine the significance of the Proposed Project, estimated daily, quarterly, and annual project air emissions were developed and compared to the thresholds identified in Section 4.5.3. Appendix C includes assumptions and project data used in calculating project emissions. The Air

Quality section only analyzes short-term emissions during the Proposed Project. After completion, there would be no long-term air emissions associated with the Proposed Project.

Typically, heavy equipment used on barges and in onshore construction, including concrete and haul trucks, is diesel engine powered. The principal pollutant of concern during construction activities similar to the proposed project is NOx, which is the principal pollutant emitted by diesel engines. Therefore, it has been conservatively assumed that all construction equipment used on the project would be diesel engine driven.

Impact AIR-1: Project Emissions in South Coast Air Basin

The Proposed Project would not exceed the SCAQMD's CEQA thresholds for emissions (Class III)

Prior to beginning activities, the crane barge and associated equipment would be towed to the project area. A deck barge would also be towed to the project site near the end of the activities and used to transport the debris from the manhole risers and terminal structures back to the Port of Long Beach. Depending on the size of the deck barge used, it may require an additional trip to haul the debris back to the Port of Long Beach. Towing the barges would require approximately 2 days. Assuming a conservative scenario, where two trips would be required of the deck barge, towing of the barges would require a total of 12 days. Table 4.5-5 presents the estimated emissions that would be generated by towing the barges. As the majority of the towing would occur within the SCAB, emissions from towing are compared to the SCAQMD thresholds of significance. Total towing emissions are compared to SCAQMD's quarterly thresholds even though not all towing would occur within the same quarter, which represents a conservative assessment of total towing emissions. As shown in Table 4.5-4, the estimated emissions would not exceed the SCAQMD daily or quarterly thresholds for any criteria pollutant and thus would not result in a significant impact on air quality. This is considered a Class III impact, and no mitigation is required.

Impact AIR-2: Project Emissions in San Diego Air Basin

The Proposed Project would not exceed air emissions thresholds established for the SDAB (Class III)

The removal and disposal of the conduits would occur in three separate environments: onshore, nearshore, and offshore. The onshore environment includes portions of the

Table 4.5-4. Estimated Emissions from Barge Towing

Equipment	Emissions – pounds per day			
	VOC	NO_X	CO	PM_{10}
Tugboat (lbs/day)	14.4	54.6	37.4	2.2
SCAQMD Daily Emission Thresholds	*75*	*100*	*550*	*150*
Does the Project Exceed Thresholds?	No	No	No	No
Total Towing (tons)	0.08	0.33	0.22	0.13
SCAQMD Quarterly Emission Thresholds	*2.5*	*2.5*	*24.75*	*6.75*
Does the Project Exceed Thresholds?	No	No	No	No

SONGS facility and the beach southwest of the SONGS facility. For the Proposed Project, the nearshore environment is characterized by water depth of less than 15 feet (4.6 m), which consists of the area extending westward approximately 1,800 feet (549 m) from the MLLW line. Water depths greater than 15 feet (4.6 m) characterize the offshore environment.

Onshore activity would involve plugging the conduits from the SONGS tsunami gates to the MLLW line, a distance of approximately 65 feet (19.9 m). The conduit has an interior diameter of approximately 12 feet and, given the length of the conduit to be plugged, would require approximately 280 CY (214 m^3) of concrete to complete the plug for each conduit. Construction work in the onshore environment would involve only the use of terrestrial equipment, which would access the project site via existing paved roadways and the SONGS facility. Table 4.5-5 lists the equipment and anticipated emissions from equipment required to complete the onshore work.

Table 4.5-5. Estimated Maximum Daily Emissions from Onshore Activities

Equipment	Emissions – pounds per day			
	VOC	NO_X	CO	PM_{10}
High Pressure Water Blasting Unit	0.7	4.9	3.7	0.2
Rough Terrain Crane	3.1	11.7	8.0	0.5
Hydraulic Pump	0.9	5.0	3.3	0.3
Diving Air Compressor	1.1	6.0	4.0	0.3
Cement Pump	0.8	6.0	4.6	0.3
10 CY Cement Trucks	5.4	21.1	14.1	0.8
120 bbl Vacuum Truck	2.7	10.6	7.0	0.4
Total Emissions	**14.7**	**65.3**	**44.7**	**2.8**

The nearshore work would include removal of manhole risers D-1 and D-2 and I-1 and I-2. Due to the low water levels closer to shore, the manhole riser removal would require the use of an SSV. The SSV would be launched from the crane barge and dragged closer to shore by a beach winch, and a winch onboard the crane barge would drag the SSV to locations offshore. The SSV would be supported by a floating umbilical from the crane barge and would not contain any air emission sources. Table 4.5-6 lists the equipment and anticipated emissions required to complete the nearshore work.

Table 4.5-6. Estimated Maximum Daily Emissions from Nearshore Activities

Equipment	Emissions – pounds per day			
	VOC	NO_X	CO	PM_{10}
High Pressure Water Blasting Unit	0.7	4.9	3.7	0.2
Industrial Air Compressor	0.9	5.0	3.3	0.3
Diving Air Compressor	0.9	5.0	3.3	0.3
Jet Pump	0.7	4.9	3.7	0.2
Hydraulic Pump	1.4	7.8	5.1	0.4
Diesel Powered Welder	0.5	3.0	2.0	0.2
Excavator	2.4	9.1	6.2	0.4
Bulldozer	3.1	11.9	8.1	0.5
Spooling Truck	0.9	6.6	5.0	0.3
Beach Winch	3.1	21.3	26.2	1.2
Crane Barge Crane	3.9	14.7	10.1	0.6
Crane Barge Generator Set	4.1	29.7	22.4	1.3
Support Tugboat	14.4	54.6	37.4	2.2
Crew Boat	4.2	15.8	10.8	0.6
Crew Boat Generator Set	1.9	11.0	7.2	0.6
Total Emissions	**43.0**	**205.2**	**154.6**	**9.2**

The offshore work would include removal of manhole risers D-3 and D-4 and I-3 through I-5 and the terminal structures at the end of each conduit. All offshore work would take place from a crane barge. The crane barge would be repositioned over each location to remove the manhole risers and the terminal structures. Table 4.5-7 lists the equipment and anticipated emissions required to complete the offshore work.

After completion of the disposition activities, a debris survey and cleanup program would be conducted. A boat would conduct a sonar scan of the area for any debris left from the work; divers would then recover the material to be shipped back to the Port of Long Beach, along with the manhole risers and terminal structures. Table 4.5-8 lists the equipment and anticipated emissions required to complete the debris survey and cleanup work.

Table 4.5-7. Estimated Maximum Daily Emissions from Offshore Activities

Equipment	Emissions – pounds per day			
	VOC	NO_X	CO	PM_{10}
High Pressure Water Blasting Unit	0.7	4.9	3.7	0.2
Industrial Air Compressor	0.9	5.0	3.3	0.3
Diving Air Compressor	0.9	5.0	3.3	0.3
Jet Pump	0.7	4.9	3.7	0.2
Hydraulic Pump	1.4	7.8	5.1	0.4
Diesel Powered Welder	0.5	3.0	2.0	0.2
Crane Barge	3.9	14.7	10.1	0.6
Crane Barge Generator	4.1	29.7	22.4	1.3
Support Tugboat	14.4	54.6	37.4	2.2
Crew Boat	4.2	15.8	10.8	0.6
Crew Boat Generator	1.9	11.0	7.2	0.6
Total Emissions	**33.5**	**156.4**	**109.0**	**6.8**

Table 4.5-8. Estimated Maximum Daily Emissions from Debris Survey and Clearance

Equipment	Emissions – pounds per day			
	VOC	NO_X	CO	PM_{10}
Debris Survey Boat	8.3	31.6	21.6	1.2
High Pressure Water Blasting Unit	0.7	4.9	3.7	0.2
Industrial Air Compressor	0.9	5.0	3.3	0.3
Diving Air Compressor	0.9	5.0	3.3	0.3
Jet Pump	0.7	4.9	3.7	0.2
Crane Barge Crane	3.9	14.7	10.1	0.6
Crane Barge Generator Set	4.1	29.7	22.4	1.3
Support Tugboat	14.4	54.6	37.4	2.2
Crew Boat	4.2	15.8	10.8	0.6
Crew Boat Generator Set	1.9	11.0	7.2	0.6
Total Emissions	**40.0**	**177.2**	**123.5**	**7.5**

The Proposed Project would require 4 months to complete. Annual emissions were developed by multiplying the daily emissions from each piece of equipment by the number days and hours each piece of equipment would operate. Hours and days of operation as well as daily emission factors are provided along with other assumptions in Appendix C. Table 4.5-9 presents the annual emissions for the Proposed Project. As

shown in Table 4.5-9, annual emissions in the SDAB associated with the Proposed Project would not exceed applicable thresholds (Class III); therefore, no mitigation is required.

Table 4.5-9. Estimated Annual Emissions

Equipment	Emissions – pounds per day			
	VOC	NO_X	CO	PM_{10}
Onshore	0.16	0.68	0.46	0.03
Nearshore	0.89	4.15	2.96	0.18
Offshore	0.74	3.43	2.39	0.15
Debris Clearance	0.82	3.77	2.64	0.16
Total Quarterly Emissions (Tons)	2.61	12.03	8.45	0.52
SDAPCD Annual Emission Thresholds (Tons)	*50*	*50*	*100*	*50*
Does the Project Exceed SDAPCD Thresholds?	No	No	No	No

Table 4.5-10 summarizes the air quality impacts and mitigation measures.

Table 4.5-10. Air Quality Impacts and Mitigation Measures

Impact	Mitigation Measures
AIR-1: Disposition Emissions in SCAB	No mitigation required
AIR-2: Disposition Emissions in SDAB	No mitigation required

4.5.5 Impacts of Alternatives

4.5.5.1 Complete Removal of Conduits Alternative

The complete excavation, removal, and disposition of the entire SONGS Unit 1 cooling water system (all structures, foundations, and other components), would have a greater air quality impact due to its duration, up to 1 year, and the use of additional heavy construction equipment.

Impact AIR-ALT-1: Complete Removal Alternative Emissions in the South Coast Air Basin

The Complete Removal Alternative could generate air emissions that exceed thresholds for construction emissions in the SCAB (Class II).

Offshore work under the Complete Removal Alternative would use similar equipment to that analyzed in the Proposed Project. However, the work would be conducted both

day and night, with clearing and excavation occurring during nighttime operations and extraction of the conduits occurring during daylight operations. It is anticipated that the equivalent of at least one barge per week of debris from offshore disposition work would be towed into the Port of Long Beach under the Complete Removal Alternative, resulting in greater emissions in the SCAB. Estimated emissions from towing activities in the SCAB for this alternative are shown in Table 4.5-11. As shown in the table, estimated NOx emissions would exceed the SCAQMD daily and quarterly thresholds, and the air quality impact would be potentially significant (Class II).

If this alternative is selected, the contractor would obtain air quality permits for the boat that will be used for towing. The permit process may require emission controls or the purchase of offsets. In either case, the granting of the permit would assure that the impact would be mitigated to a less than significant level.

Table 4.5-11. Estimated Daily and Quarterly Emissions in the SCAB – Complete Removal Alternative

	Estimated Emissions			
	VOC	**NOX**	**CO**	**PM10**
Daily Emissions – pounds	32	121	82	5
SCAQMD Emission Thresholds- pounds per day	*75*	*100*	*550*	*150*
Does the Alternative Exceed SCAQMD Thresholds?	No	**Yes**	No	No
Quarterly Emissions – tons	1.0	3.9	2.7	0.2
SCAQMD Emission Thresholds – tons per quarter	*2.5*	*2.5*	*24.75*	*6.75*
Does the Alternative Exceed SCAQMD Thresholds?	No	**Yes**	No	No

Mitigation Measures for Impact AIR-ALT-1: Construction Emissions in the SCAB

MM AIR-1 The Contractor shall obtain a permit from SCAQMD to operate the tow boat(s) in the SCAB.

Impact AIR-ALT-2: Complete Removal Alternative Emissions in the San Diego Air Basin

The Complete Removal Alternative could generate air emissions that exceed thresholds for construction emissions in the SDAB (Class II).

The onshore portion of the Complete Removal Alternative would require as much as 2 acres (0.8 ha) of beachfront for construction staging and materials storage; construction activity in this area would generate additional PM_{10} emissions. The 300-foot-long (91-m) trestle required for removing the conduits would involve a crane and other diesel engine driven equipment for installation and removal of sheet-pile barriers

extending 400 feet (122 m) from the beach along the north and south perimeters of the conduits. This alternative would require additional truck trips to import materials to onshore site, and to remove conduit debris to an appropriate recycling facility in either San Diego or Orange County.

Estimated emissions from towing activities in the SCAB for this alternative are shown in Table 4.5-12. As shown in the table, estimated NOx emissions would exceed the thresholds established for annual emissions in the SDAB, and the air quality impact would be potentially significant (Class II).

If this alternative is selected, the contractor should modify the work plan to reduce the NOx emissions. Alternative available measures include the use of electric powered equipment instead of diesel engine powered; the use of acqueous diesel fuel, which would reduce NOx emissions by approximately 14 percent; and the use of some equipment equipped with new-generation cooled, exhaust gas recirculation engines, which reduce NOx emissions by approximately 40 percent.

Table 4.5-12. Estimated Annual Emissions in the SDAB – Complete Removal Alternative

	Emissions – tons			
	VOC	**NOX**	**CO**	**PM10**
Annual Emissions	13.6	56.9	39.1	2.4
SDAPCD Annual Emission Thresholds	*50*	*50*	*100*	*50*
Does the Alternative Exceed SDAPCD Thresholds?	No	**Yes**	No	No

Mitigation Measures for Impact AIR-ALT-2: Construction Emissions in the SDAB

MM AIR-2 The Contractor shall demonstrate that the equipment and fuels have been selected to result in NOx emissions that would not exceed 50 tons per year.

4.5.5.2 Removal of Nearshore Components Alternative

Impact AIR-ALT-3: Removal of Nearshore Components Alternative Emissions in the South Coast Air Basin

The Complete Removal Alternative would not exceed the SCAQMD's CEQA thresholds for emissions (Class III)

The offshore terminal structure, manhole riser and debris removal activities would be the same as for the Proposed Project. Thus, the barge and tow boat activities would be

the same as for the proposed project, and SCAB emissions would be the same or similar to those shown in Table 4.5-4. The SCAQMD thresholds would not be exceeded, and there would be no significant impact (Class III). No mitigation is required.

Impact AIR-ALT-4: Removal of Nearshore Components Alternative Emissions in the San Diego Air Basin

The Complete Removal Alternative would not exceed air emissions thresholds established for the SDAB (Class III)

As noted above, the offshore terminal structure, manhole riser and debris removal activities in the SDAB would be the same as for the Proposed Project. The onshore activities would be the same as for the Complete Removal Alternative. The overall project effort and duration for the Nearshore Components Removal Alternative would be less than for the Complete Removal Alternative, and emissions are estimated at less than 80 percent of those shown in Table 4.5-12. Therefore, thresholds established for impact in the SDAB would not be exceeded, and there would be no significant impact (Class III). No mitigation is required.

4.5.5.3 Crush Conduits and Remove Terminal Structures Alternative

The excavation and exposure of the conduits under this alternative would be identical to the onshore portion the Complete Removal Alternative; however, the conduits would be crushed in place. This effort would employ a drop chisel-shaft to crush the conduits. The onshore and nearshore conduits would be exposed and crushed by a crane using the trestle described in the Complete Removal Alternative, while the offshore conduits would be exposed by dredging and then crushed by a crane onboard a crane barge. The conduit rubble would remain in place, with the onshore portions being buried by new fill material and the offshore conduits eventually being buried over time by migrating sediments transported by local currents.

Impact AIR-ALT-5: Crush Conduit and Remove Terminal Structures Alternative Emissions

The Crush Conduit and Remove Terminal Structures Alternative would not exceed air emission thresholds established for the SCAB or SDAB (Class III)

This alternative would cause greater impacts than the Proposed Project scenario by increasing the disturbed area and introducing significant new air emission sources or operating previously analyzed equipment for a greater amount of time. However, this

alternative would result in fewer air impacts than the Complete Removal Alternative as it would require less intense activities and less heavy construction equipment. This alternative would not require as much earth moving or truck and barge trips associated with the transport of recovered conduit components. This alternative would not exceed SDAPCD or SCAQMD thresholds (Class III). No mitigation is required.

4.5.5.4 Artificial Reef Alternative

The Artificial Reef Alternative reflects several components of the Proposed Project. It would involve dismantling the top two sections of the terminal structures and placing a steel grill over the conduit opening. The concrete sections would remain permanently on the seafloor around the existing rock riprap, creating an artificial reef, or the concrete sections could be removed and placed at another artificial reef in nearby coastal waters.

Impact AIR-ALT-6: Artificial Reef Alternative Emissions

The Artificial Reef Alternative would not exceed air emission thresholds established for the SCAB or SDAB (Class III).

Under this habitat enhancement alternative, the need for dredging would be eliminated, the manhole risers would be left undisturbed, the marker buoys and anchors would be removed, and the onshore portions of the conduits would not be plugged with concrete.

In terms of air quality, this alternative would generate the fewest environmental impacts of all the build alternatives. Daily air emissions during the removal of the terminal structures would be similar to those for offshore work under the Proposed Project, but for a shorter period, and would not exceed applicable significance thresholds for air quality (Class III). No mitigation is required.

4.5.5.5 No Project Alternative

The No Project Alternative would avoid all air emissions associated with the dispositioning of the conduits. This alternative would result in no impacts to air quality.

4.5.6 Cumulative Project Impact Analysis

The following discussion analyzes the contribution of the Proposed Project to cumulative effects on air quality. The majority of the decommissioning activities for the Proposed Project would occur offshore in the vicinity of the terminal structures. No other past, present, or reasonably foreseeable projects have been identified for the offshore area near the structures. Therefore, there would be no cumulative local air quality impact.

Due to the limited schedule of the Proposed Project, i.e., 4 months, air emissions would be short term and would cease at the completion of the project; emissions would not be cumulatively considerable. The Proposed Project does not include any long-term components, and the contribution to ongoing regional violations of Federal or State air quality standards would be negligible. Therefore, the Proposed Project, in conjunction with other known projects, would not result in a significant cumulative air quality impact.

4.5.7 References

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