5.2 AIR QUALITY

5.2.1 Environmental Setting

The proposed Project is located in the South Coast Air Basin (SCAB) with SCAQMD monitoring and regulating air quality from stationary sources within the SCAB.

REGIONAL AIR QUALITY

The air quality in the SCAB is influenced by its climate, which is in turn determined by its terrain and geographical location. The SCAB is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern border, and high mountains surround the rest of the SCAB.

The SCAB is ensconced in the semi-permanent, high-pressure zone of the eastern Pacific, thus its climate is mild, tempered by cool ocean breezes, and its salubrious climatological pattern is interrupted by rare periods of extremely hot weather or winter storms.

Annual average temperature fluctuates minimally throughout the SCAB, ranging from the low to mid 60s, measured in degrees Fahrenheit (°F). Due to more pronounced oceanic influence, coastal areas have less variability in annual minimum and maximum temperatures than inland areas.

Precipitation in the SCAB occurs mainly between November and March. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the SCAB, along the coastal side of the mountains (see subsequent section for local precipitation data.).

A temperature inversion (increasing temperature with increasing altitude) persists over much of the SCAB as a result of the strength and position of the sub-tropical high-pressure cell over the Pacific Ocean. This inversion limits the vertical dispersion of air contaminants, thereby increasing their ground level concentration. With solar heating of the ground and the lower air layer, the temperature of the air at lower elevations approaches the temperature of the base of the inversion (upper) layer until the inversion layer is eroded, enabling vertical mixing within the planetary boundary layer. This phenomenon is observed in mid-afternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by mid-morning. During the fall and winter months, Santa Ana winds – strong, dry north or northeasterly winds – disperse air contaminants for several days at a time (See subsequent section for local wind data.).

Coupling stagnant wind conditions and low inversions yield the greatest air pollutant concentrations. Ambient air pollutant concentrations are generally lowest on days of no inversion or high wind speeds. The greatest pollution problems in winter are carbon monoxide (CO) and oxides of nitrogen (NO_x) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the more intense sunshine and longer daylight hours cause hydrocarbons and NO_x to react and form photochemical smog.

The California Legislature created the SCAQMD in 1977 by merging the air pollution control districts of the four counties sharing the SCAB. The SCAB covers an area of 6,745 square miles with a population of 14.6 million, while the larger SCAQMD boundary includes 10,743 square miles and a population of 15 million. The SCAB includes portions of Los Angeles, Riverside and San Bernardino counties and all of Orange County[1].

The SCAQMD is a non-attainment area for ozone (O_3), CO, and fine, suspended particulate matter less than 10 microns (PM_{10}) and 2.5 microns in diameter ($PM_{2.5}$)[1] and in attainment for the other criteria pollutants, sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb). To maintain the attainment status and reduce emissions for the non-attainment pollutants, the SCAQMD has established daily emission thresholds for all criteria pollutants to determine the significance of air quality impact from proposed projects. A significant impact would occur if the project resulted in substantial emissions during construction or operation that would exceed the established thresholds. For example, one of the proposed alternatives is to install the sewer line along the beach to minimize traffic impact to the project area. It should be noted that depending on wind conditions throughout the day, the excavation and transporting of sand, which also contains fine particulates, could potentially become airborne and cause a nuisance to nearby residences and sun bathers. To minimize airborne particulates, construction best management practices (BMPs) such as application of water should be implemented during the construction of the proposed sewer line.

LOCAL AIR QUALITY

Annual rainfall in the vicinity of the Project site can be characterized by historical average total precipitation data from Santa Monica Pier – National Climatic Data Center (NCDC), Cooperative Station, number 047953. NCDC data indicate that the bulk of annual precipitation occurs between November (1.46 inches) and March (1.94 inches), peaking in February (3.04 inches). Summer rainfall is minimal and the average total precipitation undergoes a seasonal reduction from 0.79 inches (April) to 0.02 inches (July).

Southwesterly winds dominate in the vicinity of the project site, as evidenced by historical meteorological data records from Santa Monica Airport. Annual average wind speed was 7.4 miles per hour (mph) with the highest winds occurring from April (8.5 mph) to May (8.4 mph) and the slowest winds in January (6.2 mph).

Ambient monitoring stations are used to collect ambient criteria pollutant data, which are used to determine whether the region is in attainment with the National Ambient Air Quality Standards (NAAQS) or the California Ambient Air Quality Standards (CAAQS). The NAAQS and CAAQS are designed to protect public health and to prevent degradation of the environment. The NAAQS and CAAQS are provided in Table 5.2-1. The California Clean Air Act (CCAA) of 1988 required non-attainment areas in the state to prepare air quality attainment plans. The attainment plans are required to achieve a minimum 5 percent annual reduction in the emissions of non-attainment pollutants, unless all feasible measures have been implemented. The SCAB is currently classified as a non-attainment area for O_3, CO, $PM_{2.5}$, and PM_{10}. The SCAB is technically in attainment for CO but has not been reclassified by the EPA; therefore, the current designation is considered as serious non-attainment. The attainment status for the SCAB is provided in Table 5.2-2.

[1] U.S. Environmental Protection Agency web page - http://www.epa.gov/air/data/monvals.html

Table 5.2-1 Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	0.12 ppm (235 µg/m^3)[8]	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)*		0.08 ppm (157 µg/m^3)[8]		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation*	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Geometric Mean	20 µg/m^3		50 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		65 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	Non-dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	NDIR
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		--	--	--
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	--	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 µg/m^3)		--		
Lead[9]	30 days average	1.5 µg/m^3	Atomic Absorption	--	--	--
	Calendar Quarter	--		1.5 µg/m^3	Same as Primary Standard	High-volume Sampler and Atomic Absorption
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	Ultraviolet Fluorescence	0.30 ppm (80 µg/m^3)	--	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm 105 µg/m^3)		0.14 ppm (365 µg/m^3)	--	
	3 Hour	--		--	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		--	--	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer – visibility of 10 miles of more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		NO FEDERAL STANDARDS		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Vinyl Chloride[9]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			

** This concentration was approved by the California Air Resources Board (CARB) on April 28, 2005, and is expected to become effective in early 2006. (See Table notes provided on the following page*

Table 5.2-1 Notes:

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter-PM_{10}, $PM_{2.5}$, and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone 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 the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. 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 EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent procedure that can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.
8. New federal 8-hour ozone and fine particulate matter standards were promulgated by EPA on July 18, 1997. Contact EPA for further clarification and current federal policies.
9. The CARB has identified lead and vinyl chloride as ‘toxic air contaminants’ with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Acronyms:
$\mu g/m^3$ – micrograms per cubic meter
°C – degrees Celsius
EPA – U.S. Environmental Protection Agency
mg/m^3 – milligrams per cubic meter
ppm – parts per million

Source: California Air Resources Board (11/29/05)

Table 5.2-2 State and Federal Attainment/Non-Attainment Designations for South Coast Air Basin

Criteria Pollutant	County	State	Federal	
CO	Los Angeles County (P)	A	N	Serious
	Orange County	A	N	Serious
	Riverside County (P)	A	N	Serious
	San Bernardino County (P)	A	N	Serious
NO_x		A	A	A
SO_x		A	A	A
PM_{10}		N	N	Serious
$PM_{2.5}$		N	N	
Ozone (1-hour)		N	N	Extreme
Ozone (8-hour)		N	N	Severe 17
Lead		A		

Source: www. arb.ca.gov

The SCAQMD maintains ambient air quality monitoring stations throughout the SCAB and the air quality monitoring stations nearest to the Project site are the Lynwood (11220 Long Beach Boulevard, Lynwood) and Hawthorne (5234 West 120th Street, Hawthorne) monitoring stations located approximately 19 and 13 miles, respectively, from the VPP. While the Hawthorne station is closer to the project site, use of air quality data from the less proximate Lynwood site is necessary because the Hawthorne station lacked $PM_{2.5}$ monitoring data. Table 5.2-3 shows the criteria pollutants monitored at the Hawthorne and Lynwood stations, which include CO, O_3, NO_2, and $PM_{2.5}$. SO_2 and Pb are not listed because there have been no exceedances of the federal or state standards in the past 10 years.

The ambient air quality data in Table 5.2-3 show that CO and NO_2 levels are below the relevant state and federal standards at the Hawthorne site for the past 5 years. Hawthorne 1-hour O_3 and PM_{10} levels are below the federal standards but have exceeded the state standards within the past 5 years. The $PM_{2.5}$ concentration monitored at the Lynwood station exceeded the federal standard most recently in 2001 and has not been exceeded in the last few years.

The following paragraphs briefly describe the adverse health effects of the six criteria pollutants monitored in the Basin.

Ozone – O_3 is formed by photochemical reactions between NO_x and reactive organic gases, rather than being directly emitted. O_3 is a pungent, colorless gas typical of southern California photochemical smog. Elevated O_3 concentrations result in reduced lung function, particularly during vigorous physical activity. This health problem is particularly acute in sensitive receptors such as the sick, elderly, and young children. O_3 levels peak during the summer and early fall months.

Carbon Monoxide – CO is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions. CO passes through the lungs into the bloodstream, where it interferes with the transfer of oxygen to body tissues.

Table 5.2-3 Ambient Air Quality at Air Monitoring Stations Close to the Project Site

	Carbon Monoxide (CO)				Ozone (O_3)				Respirable Particulate Matter (PM_{10})		Fine Particulate Matter[1] ($PM_{2.5}$)		Nitrogen Dioxide (NO_2)	
	Max 1-hour Conc. (ppm)	Number of Days Exceeded	Max 8-hour Conc. (ppm)	Number of Days Exceeded	Max 1-hour Conc. (ppm)	Number of Days Exceeded	Max 8-hour Conc. (ppm)	Number of Days Exceeded	Max 24-hour Conc. ($\mu g/m^3$)	Number of Days Exceeded	Max 24-hour Conc. ($\mu g/m^3$)	Number of Days Exceeded	Max 1-hour Conc. (ppm)	Number of Days Exceeded
State Standards	> 20 ppm/ 1 hour		> = 9 ppm/ 8 hour		> 0.09 ppm/ 1 hour		> 0.070 ppm/ 8 hour[2]		> 50 $\mu g/m^3$/ 24 hour		> 65 $\mu g/m^3$/ 24 hour		> 0.25 ppm/ 1 hour	
2004	5.8	0	4.43	0	0.069	0	ND[3]	ND[2]	52.0	2	55.8	0	0.084	0
2003	6.5	0	5.04	0	0.110	2	0.077	NA[3]	58.0	3	54.8	0	0.120	0
2002	6.8	0	6.00	0	0.087	0	0.072	NA[3]	121.0	12	64.0	0	0.099	0
2001	7.3	0	5.21	0	0.098	1	0.079	NA[3]	75.0	8	73.1	3	0.110	0
2000	8.7	0	7.14	0	0.095	1	0.075	NA[3]	74.0	9	82.1	2	0.128	0
Maximum	8.7	0	7.14	0	0.110	2	0.079	NA[3]	121.0	12	82.1	3	0.128	0
Federal Standards	> 35 ppm/ 1 hour		> = 9 ppm/ 8 hour		> 0.12 ppm/ 1 hour		> 0.08 ppm/8 hour		> 150 $\mu g/m^3$/ 24 hour		> 65 $\mu g/m^3$/ 24 hour		Annual Average > 0.053 ppm/ annual avg.	
2004	7.2	0	4.43	0	0.069	0	ND[2]	ND[2]	52.0	0	55.8	0	0.030	0
2003	10.4	0	5.04	0	0.110	0	0.077	0	58.0	0	54.8	0	0.024	0
2002	12.2	0	6.00	0	0.087	0	0.072	0	121.0	0	64.0	0	0.023	0
2001	15.8	0	5.21	0	0.098	0	0.079	0	75.0	0	73.1	3	0.024	0
2000	11.7	0	7.14	0	0.095	0	0.075	0	74.0	0	82.1	2	0.027	0
Maximum	15.8	0	7.14	0	0.110	0	0.079	0	121.0	0	82.1	3	0.030	0

Notes:
1. *Fine particulate matter data are obtained from the Lynwood air monitoring station; all other tabulated data are from the Hawthorne air monitoring station.*
2. *NA – This standard was approved by the CARB on April 28, 2005 and is expected to become effective in early 2006.*
3. *ND – Insufficient data from the CARB on Hawthorne air monitoring station to determine this value.*

ppm – parts per million

$\mu g/m^3$ – micrograms per cubic meter

Oxides of Nitrogen – NO_x contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2, a reddish-brown gas, and nitric oxide, a colorless, odorless gas, are formed from fuel combustion under high temperature or pressure. These compounds are referred to as NO_x. NO_x is a primary component of the photochemical smog reaction. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide – SO_2 is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels in the SCAB. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

Reactive Organic Compounds – Reactive organic compounds (ROCs) are formed from combustion of fuels and evaporation of organic solvents. ROCs are a prime component of the photochemical smog reaction. Consequently, ROCs accumulate in the atmosphere more quickly during the winter when sunlight is limited and photochemical reactions are slower.

Particulate Matter – Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles (larger than 2.5 microns, or PM_{10}) come from a variety of sources, including windblown dust and grinding operations. Fine particles (less than 2.5 microns, or $PM_{2.5}$) often come from fuel combustion, power plants, and diesel buses and trucks. Fine particles can also be formed in the atmosphere through chemical reactions.

Coarse particles (PM_{10}) can accumulate in the respiratory system and aggravate health problems such as asthma. The U.S. Environmental Protection Agency (EPA's) scientific review concluded that fine particles ($PM_{2.5}$) at concentrations that extend well below those allowed by the current PM_{10} standards, which penetrate deeply into the lungs, are more likely than coarse particles to contribute to the health effects listed in a number of recently published community epidemiological studies. These health effects include premature death, increased hospital admissions, and emergency room visits (primarily the elderly and individuals with cardiopulmonary disease); increased respiratory symptoms and disease (children and individuals with cardiopulmonary disease such as asthma); decreased lung functions (particularly in children and individuals with asthma); and alterations in lung tissue and structure and in respiratory tract defense mechanisms.

REGIONAL AIR QUALITY PLANNING FRAMEWORK

The 1976 Lewis Air Quality Management Act established the SCAQMD and other air districts throughout the state. The Federal CAAA of 1977 required that each state adopt a State Implementation Plan (SIP) outlining pollution control measures to attain the federal standards in non-attainment areas of the state.

The California Air Resources Board (CARB) coordinates and oversees both state and federal air pollution control programs in California. The CARB oversees activities of local air quality management agencies and is responsible for incorporating Air Quality Management Plans (AQMPs) from local air basins into a SIP for federal EPA approval. The CARB also maintains air quality monitoring stations throughout the state in conjunction with local air districts. Data collected at these stations are used by the CARB to classify air basins as "attainment" or "non-attainment" with respect to each pollutant and to monitor progress in attaining air quality standards.

The CARB has divided the state into 15 air basins. Significant authority for air quality control within them has been given to local Air Pollution Control Districts or Air Quality Management Districts, which regulate stationary source emissions and develop local attainment plans. The CCAA provides the Air District with the authority to manage transportation activities at indirect sources and regulate stationary source emissions. Indirect sources of pollution are generated when minor sources collectively emit a substantial amount of pollution (e.g., the motor vehicles at an intersection, a mall, and highways). The Air Board regulates motor vehicles and fuels.

AIR QUALITY MANAGEMENT PLAN

The SCAQMD and South Coast Association of Governments (SCAG) are responsible for formulating and implementing the AQMP for the SCAB. Every 3 years, the AQMP is updated to reflect the overall plan for improving air quality in the region.

The 2003 AQMP was prepared pursuant to federal and state clean air legislation, and addresses 1990 CAA requirements with respect to particulate matter standards. Under the Clean Air Act (CAA), the AQMP must demonstrate attainment of PM_{10} standards by 2006 for both 24-hour and annual average ambient air quality standards. The 1997 AQMP responds to this requirement, relying mostly on the control measures outlined in the 1994 AQMP.

To ensure continued progress toward clean air and comply with state and federal requirements, the SCAQMD, in conjunction with the CARB, the SCAG, and the EPA, prepared and adopted the 2003 AQMP on August 1, 2003. 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. The 2003 AQMP also incorporates a revised emissions inventory, the latest modeling techniques, and updated control measures remaining from the 1997/1999 SIP, as well as new control measures. As of March 4, 2005, SCAQMD determined that the region has satisfied the federal CO standards requirements and will request the EPA to redesignate the region as attainment for CO standards. The EPA will have 18 months to process the request.

More specially, the 2003 AQMP is designed to satisfy the CCAA tri-annual update requirements and fulfills the SCAQMD's commitment to update transportation emission budgets based on the latest approved motor vehicle emissions model and planning assumptions. The SCAQMD forwarded the Final 2003 AQMP to the CARB on October 15, 2003, and in turn, the CARB submitted the 2003 AQMP to the EPA for approval on January 9, 2004.

5.2.2 Thresholds of Significance

Air quality impacts are determined by the level of significance. The analysis for the proposed project involves estimating emissions based on planning data for construction and operational activities. Construction emissions are considered short term because of the time duration. Construction emissions were quantified using emission factors provided in the SCAQMD *CEQA Air Quality Handbook* (1993), and other resources to provide an accurate impact assessment. Operational emissions were not quantified because preliminary data show that there is no change in equipment; therefore, emissions would have little to no changes and are considered negligible. As such, air quality impacts from operation of the proposed Project are considered to be less than significant and will be briefly mentioned in this analysis.

To determine significance of air quality impact from the proposed Project, either a quantitative or qualitative method can be used as both methods are accepted by regulatory agencies. A quantitative method is used when accurate and reliable project-specific data are available, which allows the estimation of criteria pollutants using an approved air quality model such as URBEMIS2002 and/or CALINE4; whereas a qualitative method is used when specific project data are inadequate for quantifying emissions. This analysis utilizes the quantitative method because construction data are available.

THRESHOLD FOR CONSTRUCTION EMISSIONS

The following significance thresholds for construction emissions have been established by the SCAQMD:

- 75 pounds per day of ROC;
- 100 pounds per day of NO_x;
- 550 pounds per day of CO;
- 150 pounds per day of PM_{10}; and
- 150 pounds per day of SO_x.

Projects in the SCAB with construction-related emissions that exceed any of the emission thresholds listed above are considered significant by the SCAQMD.

THRESHOLD FOR OPERATIONAL EMISSIONS

Specific criteria for determining whether the potential air quality impacts of a project are significant are set forth in the SCAQMD's *CEQA Air Quality Handbook* (1993 and on their web page). The criteria include operational emissions thresholds, compliance with state and national air quality standards, and consistency with the current AQMP.

SCAQMD has separate criteria for operational activities. The criteria include operational emissions thresholds, compliance with state and national air quality standards, and consistency with the current AQMP. SCAQMD established daily significance thresholds for operational emissions and are as follows:

- 55 pounds per day of volatile organic compound (VOC);
- 55 pounds per day of NO_x;
- 550 pounds per day of CO;
- 150 pounds per day of PM_{10}; and
- 150 pounds per day of SO_X.

EMISSION STANDARDS

- California state 1-hour CO standard of 20.0 parts per million (ppm);
- California state and federal 8-hour CO standard of 9.0 ppm;
- California state 1-hour average NO_2 standard of 0.25 ppm;

- Federal annual average NO_2 standard of 0.053 ppm; and
- California state annual arithmetic mean for PM_{10} of 20 micrograms per cubic meter ($\mu g/m^3$).

SCAQMD is in attainment for CO and NO_2 and non-attainment for PM_{10}; therefore, a project is considered to be significant if it causes or contributes to an exceedance of one or more of the above standards. Project PM_{10} emissions are considered to be significant if the project increases the PM_{10} 24-hour average by 10.4 $\mu g/m^3$ for construction and 2.5 $\mu g/m^3$ for operation, or annual (geometric) average concentrations by 1 $\mu g/m^3$.

5.2.3 Environmental Impacts

Air pollutant emissions associated with the project would occur over the short and the long term. Short-term emissions are from construction activities such as fugitive dust from site preparation, soil excavation, and emissions from construction equipment exhaust. Long-term emissions are from equipment used for the proposed Project such as maintenance vehicles traveling to and from the pump station to service the equipment or to take readings. To determine whether the proposed Project would have a significant impact on air quality, the analysis has to show that the implementation of the proposed Project would not generate an increase in emissions that would exceed the SCAQMD construction and operational significance thresholds.

Potential adverse air quality impacts could occur during the course of construction and is associated with exhaust emissions generated by heavy-duty construction equipment, off-road mobile sources (construction equipment), on-road mobile sources (e.g., construction worker vehicle trips, materials transport, etc.), and fugitive dust.

The net change in emissions from the operation of the proposed Project is expected to be negligible because preliminary data indicate that the same equipment would be used with the same operating hours. As such, there would not, or there are not expected to be, any long-term air quality impacts from the operation of the proposed Project and, therefore, these will not be discussed further in this analysis.

5.2.3.1 Construction-Related Impacts

EQUIPMENT EXHAUSTS AND RELATED ACTIVITIES

Construction activities produce combustion emissions from various sources such as site grading, generators, worker's vehicles, on-site heavy-duty construction vehicles, and trucks hauling materials to and from the site. Exhaust and fugitive dust emissions from construction activities on site would vary daily as construction activity levels change. The use of construction equipment on site would potentially result in localized air quality impacts. Emissions from construction equipment generated from site grading activities were calculated using emission factors provided in the SCAQMD's *CEQA Air Quality Handbook*. Since the TBM is electrically driven, micro-tunneling is anticipated to produce minimal emissions if the TBM can be powered directly from the City's electrical grid.

Preliminary plans assume that two independent construction worker teams would be involved for two different construction techniques. One team would be responsible for tunneling the 1,800-foot section that crosses the Marina and Ballona Creek Channel and the other team would perform the open trench techniques elsewhere along each alignment (approximately 8,200 to 8,600 feet). The following assumptions were also made in the calculations of the emissions from construction activities:

- The construction activities would operate 6.5 hours per day (as per the Mayoral Directive restricting on-street construction work hours);
- The construction zones have a total area of approximately 0.5 acre each; and
- The TBM and some of its associated paraphernalia (slurry settling tank, slurry pump and control trailer) emit negligible quantities of criteria pollutants because they are electrically driven.

Tables provided in Appendix C list the construction equipment and associated exhaust emissions from open trench and micro-tunneling methods, respectively. The list of equipment is derived from the Kaku Draft Traffic Report, September 1, 2005 conducted for this project and included in Appendix.

Total daily construction emissions from open trenching and micro-tunneling are summarized and compared with the SCAQMD daily construction significance thresholds. The estimated construction emissions are under the SCAQMD significance thresholds for all criteria pollutants, with the exception of NO_x emission. Thus, the combination of open trench and micro-tunneling construction is expected to have a significant impact on air quality, unless mitigation measures for NO_x are implemented. To mitigate NO_x emissions, there are several alternatives such as:

- Strategize and plan ahead to minimize the transporting of construction equipment and excessive material to and from work area;
- Optimizing construction crew size and proper selection of equipment to reduce any unnecessary emissions such as to eliminate redundancy or similarity in equipment capable of doing similar work in the same construction zone, e.g., excavator vs. backhoe;
- Adjusting the electronic timing on the construction equipment to reduce NO_x emissions;
- Use newer construction equipment such as equipment meeting Tier 2 emission standards;
- Minimize idling emissions from construction equipment and haul trucks by turning it off when not in use or during potential long delays (i.e., over 5 minutes);
- Optimize the muck removal schedule to reduce emissions from haul trucks; and
- Use of alternative fuel such as biodiesel, liquid natural gas, and propane.

Another option for further investigation should NO_x emissions become a primary concern is the large (mined) tunneling method.

FUGITIVE DUST

Fugitive dust emissions are generally associated with demolition, land clearing, exposure, and cut and fill operations. Dust generated during construction would vary substantially, depending on the level of activity, the specific operations, and weather conditions. Nearby sensitive receptors and on-site workers may be exposed to blowing dust, depending upon prevailing wind conditions. Table 5.2-4 presents the best available control measures for high wind conditions. Fugitive dust would also be generated as construction equipment travels on unpaved roads or on the construction site. The fugitive PM_{10} emissions rate used in the Air Quality Analysis (AQA), 0.42 tons per acre-month (30 days), is for road construction, which is applicable to this Project. Approximately 28 pounds per day is generated each day during construction of the proposed Project. To minimize fugitive dust, control measures are provided in Table5.2-4, 5.2-5 and Table 5.2-6.

Table 5.2-4 Best Available Control Measures For High Wind Conditions

Fugitive Dust Source Category		Control Measures
Earth-moving	(1A)	Cease all active operations; OR
	(2A)	Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	(0B)	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of 6 months; OR
	(1B)	Apply chemical stabilizers prior to wind event; OR
	(2B)	Apply water to all unstabilized disturbed areas three times per day. If there is any evidence of wind-driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR
	(3B)	Take the actions specified in Table 5-2 of the technical study (Appendix C), Item (3c); OR
	(4B)	Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	(1C)	Apply chemical stabilizers prior to wind event; OR
	(2C)	Apply water twice per hour during active operation; OR
	(3C)	Stop all vehicular traffic.
Open storage piles	(1D)	Apply water twice per hour; OR
	(2D)	Install temporary coverings.
Paved road track-out	(1E)	Cover all haul vehicles; OR
	(2E)	Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	(1F)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 5-1 of the technical study (Appendix C) may be used.

Table 5.2-5 Dust Control Actions

Fugitive Dust Source Category	Control Actions	
Earth-moving (except construction cutting and filling areas, and mining operations)	(1a)	Maintain soil moisture content at a minimum of 12 percent, as determined by American Society for Testing and Materials (ASTM) Method D-2216, or other equivalent method approved by the Executive Officer, the CARB, and the EPA. Two soil moisture evaluations must be conducted during the first 3 hours of active operations during a calendar day, and two such evaluations each subsequent 4-hour period of active operations; OR
	(1a-1)	For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: construction fill areas	(1b)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM Method D-2216, or other equivalent method approved by the Executive Officer, the CARB, and the EPA. For areas which have optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the CARB and the EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first 3 hours of active operations during a calendar day, and two such evaluations during each subsequent 4-hour period of active operations.
Earth-moving: construction cut areas and mining operations	(1c)	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	(2a/b)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind-driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: completed grading areas	(2c)	Apply chemical stabilizers within 5 working days of grading completion; OR
	(2d)	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	(3a)	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	(3b)	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	(3c)	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	(3d)	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved roads	(4a)	Water all roads used for any vehicular traffic at least once per every 2 hours of active operations ; OR
	(4b)	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 mph; OR
	(4c)	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	(5a)	Apply chemical stabilizers; OR
	(5b)	Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust; OR
	(5c)	Install temporary coverings; OR
	(5d)	Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile.
All Categories	(6a)	Any other control measures approved by the Executive Officer and the EPA as equivalent to the methods specified in Table 5-2 of the technical study (Appendix C) may be used.

Table 5.2-6 Track-out Control Options

(1)	Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet.
(2)	Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.
(3)	Any other control measures approved by the Executive Officer and the EPA as equivalent to the methods specified in Table 5-3 of the technical study (Appendix C) may be used.

The combination of the PM_{10} fugitive dust and PM_{10} exhaust emissions from construction equipment are added together and compared to the SCAQMD daily threshold for PM_{10} to determine whether the Project has a significant impact on air quality. Total PM_{10} emissions, 22.6 pounds per day, from both construction operations are significantly lower than the SCAQMD daily threshold for PM_{10} of 150 pounds per day.

5.2.3.2 Operational Impacts

The proposed Project is anticipated to emit minimal odors. Once operational, the proposed Project would operate with minimal need for on-site maintenance under normal conditions. The total amounts of emissions from maintenance worker vehicle exhaust are considered negligible and would not have a significant impact on air quality.

Based on the above operational characteristics, the proposed Project is not likely to impede the progress of the SCAB in complying with federal or state ambient air quality standards, expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors.

5.2.4 Mitigation Measures

Mitigation measures are not required for the operation of the proposed project because there would not be a significant long-term impact upon air quality.

NO_x emissions arising from short-term construction activities may be addressed by implementing various innovative emission control technologies (e.g., use of fuel additives, electronic timing and metering and use of alternative fuel).

FUGITIVE DUST CONTROL MEASURES

The Project would be required to comply with regional rules, which would assist in reducing short-term air pollutant emissions. SCAQMD Rule 403 requires that fugitive dust be controlled with best available control measures (BACMs) so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rule 402 prohibits dust from creating a nuisance off site. These dust suppression techniques were summarized in Table 5.2-5 above. Implementation of these dust suppression techniques, as required by the SCAQMD, can reduce the fugitive dust generation (and thus the PM_{10} component) by 50 to 75 percent. Compliance with the following BACMs would reduce impacts on nearby sensitive receptors.

5.2.5 Unavoidable Adverse Project Impacts

Although the short-term construction emissions will contribute to the existing non-attainment status, the operation and construction of the proposed project is not expected to exacerbate long-term air quality. BACMs and other feasible control measures are suggested to reduce fugitive dust and other emissions from the construction zones.

5.2.6 Cumulative Impacts

CONSTRUCTION EMISSIONS

The implementation of the proposed Project and other development projects in the general vicinity of the Project area may be simultaneously under construction. Depending on construction schedules of all the projects in the area, fugitive dust and pollutant emissions generated during construction may result in substantial short-term increases in air pollutants, which would contribute to short-term cumulative air quality impacts. Traffic analysis conducted by Kaku Associates in September 1, 2005, has indicated that of the nine study intersections in the vicinity of the proposed project, six of study intersections currently operate at “acceptable” levels of service (LOS D or better) during the morning and afternoon peak traffic periods. LOS D may be defined as imposing delays that may be substantial during portions of the rush hours, but having enough lower volume periods to permit clearing of developing lines, thereby preventing excessive backups. Of these six intersections, four are operating at LOS B or better, i.e., reasonably unimpeded operations with slightly restricted maneuverability and stopped delays that are considered acceptable LOS.

PROJECT EMISSIONS

Currently, the SCAB is in non-attainment for O_3, PM_{10}, and $PM_{2.5}$. Preliminary data indicates that the maintenance schedule and equipment would remain the same; therefore, the operation of the proposed project should have an essentially negligible impact on the existing air quality status.