Air Quality Assessment For:

HOAG HOSPITAL MASTER PLAN

CITY OF NEWPORT BEACH

Prepared For:

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1.1 Project Description

Hoag Hospital is an existing facility located at One Hoag Drive in the City of Newport Beach. The facility is a 409-bed acute care, not for profit hospital. Exhibit 1 presents a vicinity map showing the location of the facility. The site is bounded by Hospital Road to the north, West Coast Highway to the south, and Newport Boulevard to the east. Residential development abuts the western edge of the Upper Campus and open space is to the west of the Lower Campus. Superior Avenue is the closest major street to the west. The approximately 38-acre site is split into two planning areas, the 17.57 acre Upper Campus and the 20.41 acre Lower Campus. The Lower Campus is the portion of the site located along the north side of Pacific Coast Highway. The Upper Campus is the portion of the site south of Hospital Road.

The Project proposes to allow greater flexibility in the placement of development on the project site, specifically to allow square footage currently allocated for the Lower Campus to be constructed on the Upper Campus. The Project would transfer up to 225,000 square feet of medical uses from the Lower Campus to the Upper Campus. A Project Alternative is assessed that would allow the transfer of up to 150,000 square feet from the Lower Campus to the Upper Campus.

Table 1 presents a summary of the development at Hoag Hospital under existing conditions and future conditions with and without the Project. The campus is currently developed with 886,270 square feet of medical uses and 409 hospital beds. The Upper Campus consists of 698,121 square feet of development and the Lower Campus consists of 188,149 square feet of development.

Under the current City of Newport Beach General Plan, development at the hospital can be increased by 456,968 square feet to 1,343,238 square feet. The Project does not propose to change this. Without the Project, an additional 67,228 square feet would be added to the Upper Campus and an additional 389,740 square feet would be added the Lower Campus. With the Project, 292,228 square feet of development would be added to the Upper Campus and 164,740 square feet of development would be added to the Lower Campus (assuming transfer of the maximum of 225,000 square feet). With the Project Alternative, 217,228 square feet of development would be added to the Upper Campus and 239,740 square feet of development would be added to the Lower Campus (assuming transfer of the maximum of 150,000 square feet).

Exhibit 1
Vicinity Map

Mestre Greve Associates

Table 1
Hoag Hospital Campus Development Summary

	Existing	Without Project Increase	Without Project Total	With Project Increase	With Project Total	With Alternative Increase	With Alternative Total
Hospital Beds	409	0	409	76	485	76	485
Upper Campus TSF	698.1	67.2	765.3	292.2	990.3	217.2	915.3
Lower Campus TSF	188.1	389.7	577.9	164.7	352.9	239.7	427.9
Total TSF	**886.3**	**457.0**	**1,343.2**	**457.0**	**1,343.2**	**457.0**	**1,343.2**

TSF-Thousand Square Feet
† The increase and total development for the upper and lower campus shown is the maximum increase for either campus. However, the total increase and total development cannot exceed the amount shown in the last row of the columns.

The number of beds in the hospital is not restricted as long as the addition of beds does not create any new unanticipated traffic impacts. For purposes of the traffic study assumptions were made about future conditions with and without the proposed Project for trip generation. The bed counts presented in Table 1 reflect the assumptions used in the traffic study. Without the Project, the bed count at the hospital would be expected to remain unchanged. With the Project, or the Project Alternative, the bed count of the hospital is projected to increase by 76 beds from 409 to 485. Utilization of a 76-bed increase for the Project Alternative is considered conservative given the proposed Project would reallocate more square footage then the alternative.

Note that the Project only proposes modifying the allowable development on the Hoag Hospital Campus and does not propose any specific projects.

This report analyzes the potential air quality impacts associated with the proposed Project. Regional air quality impacts from construction and operation of the proposed Project are analyzed, as are potential local air quality impacts.

1.2 Local, State, and Federal Air Quality Agencies

The proposed Project is located in the South Coast Air Basin (SCAB). The SCAB is comprised of parts of Los Angeles, Riverside and San Bernardino counties and all of Orange County. The basin is bounded on the west by the Pacific Ocean and surrounded on the other sides by mountains. To the north lie the San Gabriel mountains, to the north and east the San Bernardino Mountains, to the southeast the San Jacinto Mountains and to the south the Santa Ana Mountains. The basin forms a low plain and the mountains channel and confine air flow which trap air pollutants.

The primary agencies responsible for regulations to improve air quality in the SCAB are the South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (CARB). The Southern California Association of Governments (SCAG) is an important partner to the SCAQMD, as it is the designated metropolitan planning authority for the area and produces estimates of anticipated future growth and vehicular travel in the basin which are used for air quality planning. The SCAQMD sets and enforces regulations for non-vehicular sources of air pollution in the basin and works with SCAG to develop and implement Transportation Control Measures (TCM). TCM measures are intended to reduce and improve vehicular travel and associated pollutant emissions.

CARB was established in 1967 by the California Legislature to attain and maintain healthy air quality, conduct research into the causes and solutions to air pollution, and systematically attack the serious problem caused by motor vehicles, which are the major causes of air pollution in the State. CARB sets and enforces emission standards for motor vehicles, fuels, and consumer products. It sets the health based California Ambient Air Quality Standards (CAAQS) and monitors air quality levels throughout the state. The board identifies and sets control measures for toxic air contaminants. The board also performs air quality related research, provides compliance assistance for businesses, and produces education and outreach programs and materials. CARB provides assistance for local air quality districts, such as SCAQMD.

The U.S. Environmental Protection Agency (U.S. EPA) is the primary federal agency for regulating air quality. The EPA implements the provisions of the Federal Clean Air Act (FCAA). This Act establishes national ambient air quality standards (NAAQS) that are applicable nationwide. The EPA designates areas with pollutant concentrations that do not meet the NAAQS as non-attainment areas for each criteria pollutant. States are required by the FCAA to prepare State Implementation Plans (SIP) for designated non-attainment areas. The SIP is required to demonstrate how the areas will attain the NAAQS by the prescribed deadlines and what measures will be required to attain the standards. The EPA also oversees implementation of the prescribed measures. Areas that achieve the NAAQS after a non-attainment designation are redesignated as maintenance areas and must have approved Maintenance Plans to ensure continued attainment of the NAAQS.

The CCAA required all air pollution control districts in the state to prepare a plan prior to December 31, 1994 to reduce pollutant concentrations exceeding the CAAQS and ultimately achieve the CAAQS. The districts are required to review and revise these plans every three years. The SCAQMD satisfies this requirement through the publication of an Air Quality Management Plan (AQMP). The AQMP is developed by SCAQMD and SCAG in coordination with local governments and the private sector. The AQMP is incorporated into the SIP by CARB to satisfy the FCAA requirements discussed above. The AQMP is discussed further in Section 1.5.

1.3 Criteria Pollutants and Standards

Under the Federal Clean Air Act (FCAA), the U.S. EPA has established National Ambient Air Quality Standards (NAAQS) for six major pollutants; ozone (O_3), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. These six air pollutants are often referred to as the criteria pollutants. The NAAQS are two tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (i.e., impairment of visibility, damage to vegetation and property).

Under the California Clean Air Act (CCAA), the California Air Resources Board have established California Ambient Air Quality Standards (CAAQS) to protect the health and welfare of Californians. State standards have been established for the six criteria pollutants as well as four additional pollutants; visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride.

Table 2 presents the state and national ambient air quality standards. A brief explanation of each pollutant and their health effects is presented follows.

1.3.1 Ozone (O_3)

Ozone is a secondary pollutant; it is not directly emitted. Ozone is the result of chemical reactions between volatile organic compounds (VOC) (also referred to as reactive organic gasses (ROG)) and nitrogen oxides (NO_x), which occur only in the presence of bright sunlight. Sunlight and hot weather cause ground-level ozone to form in the air. As a result, it is known as a summertime air pollutant. Ground-level ozone is the primary constituent of smog. Because ozone is formed in the atmosphere, high concentrations can occur in areas well away from sources of its constituent pollutants.

People with lung disease, children, older adults, and people who are active can be affected when ozone levels are unhealthy. Numerous scientific studies have linked ground-level ozone exposure to a variety of problems, including:

- lung irritation that can cause inflammation much like a sunburn;
- wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities;
- permanent lung damage to those with repeated exposure to ozone pollution; and
- aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Ground-level ozone can have detrimental effects on plants and ecosystems. These effects include:

- interfering with the ability of sensitive plants to produce and store food, making them more susceptible to certain diseases, insects, other pollutants, competition and harsh weather;
- damaging the leaves of trees and other plants, negatively impacting the appearance of urban vegetation, national parks, and recreation areas; and
- reducing crop yields and forest growth, potentially impacting species diversity in ecosystems.

Table 2
Ambient Air Quality Standards

Pollutant	Averaging Time	State Standards[1,3]	Federal Standards[2]	
			Primary[3,5]	Secondary[3,6]
Ozone (O_3)	1 Hour	0.09 ppm (180 $\mu g/m^3$)	--	--
	8 Hour	0.070 ppm (137 $\mu g/m^3$)	0.08 ppm (157 $\mu g/m^3$)	Same as Primary
Respirable Particulate Matter (PM_{10})[8]	24 Hour	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as Primary
	AAM[6]	20 $\mu g/m^3$	--	Same as Primary
Fine Particulate Matter ($PM_{2.5}$)[8]	24 Hour	--	35 $\mu g/m^3$	Same as Primary
	AAM[6]	12 $\mu g/m^3$	15 $\mu g/m^3$	Same as Primary
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	None
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)	--	--
Nitrogen Dioxide (NO_2)	AAM[6]	0.030 ppm (56 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	Same as Primary
	1 Hour	0.18 ppm (338 $\mu g/m^3$)	--	--
Sulfur Dioxide (SO_2)	AAM[6]	--	0.030 ppm (80 $\mu g/m^3$)	--
	24 Hour	0.04 ppm (105 $\mu g/m^3$)	0.14 ppm (365 $\mu g/m^3$)	--
	3 Hour	--	--	0.5 ppm (1,300 $\mu g/m^3$)
	1 Hour	0.25 ppm (655 $\mu g/m^3$)	--	--
Lead[7]	30 day Avg.	1.5 $\mu g/m^3$	--	--
	Calendar Quarter	--	1.5 $\mu g/m^3$	Same as Primary
Visibility Reducing Particles	8 hour	Extinction coefficient of 0.23 per km -- visibility ≥ 10 miles (0.07 per km -- ≥30 miles for Lake Tahoe)	**No Federal Standards**	
Sulfates	24 Hour	25 $\mu g/m^3$		
Hydorgen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)		
Vinyl Chloride[7]	24 Hour	0.01 ppm (26 $\mu g/m^3$)		

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, 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.
2. National standards (other than ozone, $PM_{10,}$ $PM_{2.5}$,, 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 eight hour concentration in a year, averaged over three 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 calender 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 three years, are equal to or less than the standard. Contact U.S. 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. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
6. Annual Arithmetic Mean
7. The ARB 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.
8. On September 21, 2006 EPA published a final rule revoking the annual 50 $\mu g/m^3$ PM_{10} standard and lowering the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$. Attainment designations are to be issued in December, 2009 with attainment plans due April, 2010.

-- No Standard

1.3.2 Particulate Matter (PM_{10} & $PM_{2.5}$)

Particulate matter includes both aerosols and solid particles of a wide range of size and composition. Of particular concern are those particles smaller than 10 microns in size (PM_{10}) and smaller than or equal to 2.5 microns ($PM_{2.5}$). The size of the particulate matter is referenced to the aerodynamic diameter of the particulate. Smaller particulates are of greater concern because they can penetrate deeper into the lungs than large particles.

The principal health effect of airborne particulate matter is on the respiratory system. Short term exposures to high $PM_{2.5}$ levels are associated with premature mortality and increased hospital admissions and emergency room visits. Long term exposures to high $PM_{2.5}$ levels are associated with premature mortality and development of chronic respiratory disease. Short-term exposure to high PM_{10} levels are associated with hospital admissions for cardiopulmonary diseases, increased respiratory symptoms and possible premature mortality. The EPA has concluded that available evidence does not suggest an association between long-term exposure to PM_{10} at current ambient levels and health effects.

$PM_{2.5}$ is directly emitted in combustion exhaust and formed from atmospheric reactions between of various gaseous pollutants including nitrogen oxides (NO_x) sulfur oxides (SO_x) and volatile organic compounds (VOC). PM_{10} is generally emitted directly as a result of mechanical processes that crush or grind larger particles or the re suspension of dusts most typically through construction activities and vehicular travels. $PM_{2.5}$ can remain suspended in the atmosphere for days and weeks and can be transported long distances. PM_{10} generally settles out of the atmosphere rapidly and are not readily transported over large distances.

1.3.3 Carbon Monoxide (CO)

Carbon monoxide is a colorless and odorless gas, which in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Carbon monoxide combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High carbon monoxide concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. Carbon monoxide concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections, along heavily used roadways carrying slow-moving traffic, and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of carbon monoxide are limited to locations within a relatively short distance (i.e., up to 600 feet or 185 meters) of heavily traveled roadways. Overall carbon monoxide emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

1.3.4 Nitrogen Dioxide (NO_2)

Nitrogen gas, normally relatively inert (unreactive), comprises about 80% of the air. At high temperatures (i.e., in the combustion process) and under certain other conditions it can combine with oxygen, forming several different gaseous compounds collectively called nitrogen oxides (NO_x). Nitric oxide (NO) and nitrogen dioxide (NO_2) are the two most important compounds. Nitric oxide is converted to nitrogen dioxide in the atmosphere. Nitrogen dioxide (NO_2) is a red-brown pungent gas. Motor vehicle emissions are the main source of NO_x in urban areas.

Nitrogen dioxide is toxic to various animals as well as to humans. Its toxicity relates to its ability to form nitric acid with water in the eye, lung, mucus membrane and skin. In animals, long-term exposure to nitrogen oxides increases susceptibility to respiratory infections lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO_2 can suffer lung irritation and potentially, lung damage. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

NO_x is a combination of primarily NO and NO_2. While the NAAQS only addresses NO_2, NO and the total group of nitrogen oxides is of concern. NO and NO_2 are both precursors in the formation of ozone and secondary particulate matter as discussed in Sections 1.3.1 and 1.3.2. Because of this and that NO emissions largely convert to NO_2, NO_x emissions are typically examined when assessing potential air quality impacts.

1.3.5 Sulfur Dioxide (SO_2)

Sulfur oxides (SO_x) constitute a class of compounds of which sulfur dioxide (SO_2) and sulfur trioxide (SO_3) are of greatest importance. Ninety-five percent of pollution related SO_x emissions are in the form of SO_2. SO_x emissions are typically examined when assessing potential air quality impacts of SO_2. Combustion of fossil fuels for generation of electric power is the primary contributor of SO_x emissions. Industrial processes, such as nonferrous metal smelting, also contribute to SO_x emissions. SO_x is also formed during combustion of motor fuels. However, most of the sulfur has been removed from fuels greatly reducing SO_x emissions from vehicles.

SO_2 combines easily with water vapor, forming aerosols of sulfurous acid (H_2SO_3), a colorless, mildly corrosive liquid. This liquid may then combine with oxygen in the air, forming the even more irritating and corrosive sulfuric acid (H_2SO_4). Peak levels of SO_2 in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO_2 gas and particles cause respiratory illness and aggravate existing heart disease. SO_2 reacts with other chemicals in the air to form tiny sulfate particles which are measured as $PM_{2.5}$. The heath effects of $PM_{2.5}$ are discussed in Section 1.3.2.

1.3.6 Lead (Pb)

Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the blood-forming or hematopoletic, the nervous, and the renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological, and gastrointestinal systems, although there is significant individual variability in response to lead exposure. Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles, and decline in production of leaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e. lead smelters) and are not applied to transportation projects.

1.3.7 Visibility Reducing Particulates

Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt. The Statewide standard is intended to limit the frequency and severity of visibility impairment due to regional haze. A separate standard for visibility-reducing particles that is applicable only in the Lake Tahoe Air Basin is based on reduction in scenic quality.

1.3.8 Sulfates(SO_4^{2-})

Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and / or hydrogen ions. 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 sulfur dioxide (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 cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to fact that they are usually acidic, can harm ecosystems and damage materials and property.

1.3.9 Hydrogen Sulfide (H_2S)

Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. It can also be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation. Breathing H_2S 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 H_2S is adequate to protect public health and to significantly reduce odor annoyance.

1.3.10 Vinyl Chloride (Chloroethene)

Vinyl chloride (chloroethene), 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 in 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.

1.4 South Coast Air Basin Air Quality Attainment Designations

Based on monitored air pollutant concentrations, the U.S. EPA and CARB designate areas relative to their status in attaining the NAAQS and CAAQS respectively. Table 3 lists the current attainment designations for the SCAB. For the Federal standards, the required attainment date is also shown. The Unclassified designation indicates that the air quality data for the area does not support a designation of attainment or nonattainment.

Table 3
Designations of Criteria Pollutants for the SCAB

Pollutant	Federal	State
Ozone (O_3)	Severe-17 Nonattainment (2021)	Nonattainment
Respirable Particulate Matter (PM_{10})	Serious Nonattainment (2006)	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment (2015)	Nonattainment
Carbon Monoxide (CO)	Attainment/Maintenance (2000)	Attainment
Nitrogen Dioxide (NO_2)	Attainment/Maintenance (1995)	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Attainment
Visibility Reducing Particles	n/a	Unclassified
Sulfates	n/a	Unclassified
Hydrogen Sulfide	n/a	Attainment
Vinyl Chloride	n/a	Attainment

Table 3 shows that the U.S. EPA has designated SCAB as Severe-17 non-attainment for ozone, serious non-attainment for PM_{10}, non-attainment for $PM_{2.5}$, and attainment/maintenance for CO and NO_2. The basin has been designated by the state as non-attainment for ozone, PM_{10}, and $PM_{2.5}$. For the federal designations, the qualifiers, Severe-17 and Serious, affect the required attainment dates as the federal regulations have different requirements for areas that exceed the standards by greater amounts at the time of attainment/non-attainment designation.

The SCAB is designated as in attainment of the Federal SO_2 and lead NAAQS as well as the state CO, NO_2, SO_2, lead, hydrogen sulfide, and vinyl chloride VAAQS.

In July 1997, U.S. EPA issued a new ozone NAAQS of 0.08 ppm using an 8-hour averaging time. Implementation of this standard was delayed by several lawsuits. Attainment/non-attainment designations for the new 8-hour ozone standard were issued on April 15, 2004 and became effective on June 15, 2005. The SCAB was designated severe-17 non-attainment, which requires attainment of the Federal Standard by June 15, 2021. As a part of the designation, the EPA announced that the 1-hour ozone standard would be revoked in June of 2005. Thus, the 8-hour ozone standard attainment deadline of 2021 supercedes and replaces the previous 1-hour ozone standard attainment deadline of 2010.

The SCAQMD is requesting that U.S. EPA change the nonattainment status of the 8-hour ozone standard to extreme. This will allow the use of undefined reductions (i.e. “black box”) based on the anticipated development of new control technologies or improvement of existing technologies in the attainment plan. Further, the extreme classification could extend the attainment date by three years to 2024.

On April 28, 2005, CARB adopted an 8-hour ozone standard of 0.070 ppm. The California Office of Administrative Law approved the rulemaking and filed it with the Secretary of State on April 17, 2006. The standard became effective on May 17, 2006. California has retained the 1-hour concentration standard of 0.09 ppm. To be redesignated as attainment by the state the basin will need to achieve both the 1-hour and 8-hour ozone standards.

The SCAB was designated as moderate non-attainment of the PM_{10} standards when the designations were initially made in 1990 with a required attainment date of 1994. In 1993, the basin was redesignated as serious non-attainment with a required attainment date of 2006 because it was apparent that the basin could not meet the PM_{10} standard by the 1994 deadline. At this time, the Basin has met the PM_{10} standards at all monitoring stations except the western Riverside where the annual PM_{10} standard has not been met. However, on September 21, 2006, the U.S. EPA announced that it was revoking the annual PM_{10} standard as research had indicated that there were no considerable health effects associated with long-term exposure to PM_{10}. With this change, the basin is technically in attainment of the federal PM_{10} standards although the redesignation process has not yet begun.

In July 1997, U.S. EPA issued NAAQS for fine particulate matter ($PM_{2.5}$). The $PM_{2.5}$ standards include an annual standard set at 15 micrograms per cubic meter ($\mu g/m^3$), based on the three-year average of annual mean $PM_{2.5}$ concentrations and a 24-hour standard of 65 $\mu g/m^3$, based on the three-year average of the 98th percentile of 24-hour concentrations. Implementation of these standards was delayed by several lawsuits. On January 5, 2005, EPA took final action to designate attainment and nonattainment areas under the NAAQS for $PM_{2.5}$ effective April 5, 2005. The SCAB was designated as non-attainment with an attainment required as soon as possible but no later than 2010. EPA may grant attainment date extensions of up to five years in areas with more severe $PM_{2.5}$ problems and where emissions control measures are not available or feasible. It is likely that the SCAB will need this additional time to attain the standard

On September 21, 2006, the U.S. EPA announced that the 24-hour $PM_{2.5}$ standard was lowered to 35 $\mu g/m^3$. Attainment/non-attainment designations for the revised $PM_{2.5}$ standard will be made by December of 2009 with an attainment date of April 2015 although an extension of up to five years could be granted by the U.S. EPA.

The Federal attainment deadline for CO was to be December 31, 2000, however the basin was granted an extension due to exceedances of the CO NAAQS. The SCAB has not had any violations of the federal CO standards since 2002. In March 2005, the South Coast AQMD adopted a CO Redesignation Request and Maintenance Plan. On May 11, 2007, the U.S. EPA announced approval of the Redesignation Request and Maintenance Plan and that, effective June 11, 2007, the SCAB would be re-designated as attainment/maintenance for the federal CO NAAQS. The plan provides for maintenance of the federal CO air quality standard until at least 2015 and commits to revising the Plan in 2013 to ensure maintenance through 2025.

The federal annual NO_2 standard was met for the first time in 1992 and has not been exceeded since. The SCAB was redesignated as attainment for NO_2 in 1998. The basin will remain a maintenance/attainment area until 2018, assuming the NO_2 standard is not exceeded.

Table 3 shows that SCAB is designated as in attainment of the SO_2 and lead NAAQS as well as the state CO, NO_2, SO_2, lead, hydrogen sulfide, and vinyl chloride CAAQS. Generally, these pollutants are not considered a concern in the SCAB.

1.5 Air Quality Management Plan (AQMP)

As, discussed above the CAA requires plans to demonstrate attainment of the NAAQS for which an area is designated as nonattainment. Further, the CCAA requires SCAQMD to revise its plan to reduce pollutant concentrations exceeding the CAAQS every three years. In the SCAB, SCAQMD and SCAG, in coordination with local governments and the private sector, develop the Air Quality Management Plan (AQMP) for the air basin to satisfy these requirements. The AQMP is the most important air management document for the basin because it provides the blueprint for meeting state and federal ambient air quality standards.

The 1997 AQMP is the current federally approved applicable air plan for ozone. The successor 2003 AQMP was adopted locally on August 1, 2003, by the governing board of the SCAQMD. CARB adopted the plan as part of the California State Implementation Plan on October 23, 2003. The EPA adopted the mobile source emission budgets from the plan on March 25, 2004. The PM_{10} attainment plan from the 2003 AQMP received final approval on November 14, 2005 with an effective date of December 14, 2005. The EPA has not approved the ozone attainment plan of the 2003 AQMP to date. For federal purposes, the 1997 AQMP with the 1999 amendments is the currently applicable ozone attainment plan.

The overall control strategy for the 2003 AQMP is to meet applicable state and federal requirements and to demonstrate attainment with ambient air quality standards. The 2003 AQMP contains short- and long-term measures. These measures are included in Appendix IV-B of the AQMP.

Short-term measures propose the application of available technologies and management practices between 2005 and the year 2010. The 2003 AQMP includes 24 short-term control measures for stationary and mobile sources that are expected to be implemented within the next several years. The stationary source measures in the 2003 AQMP include measures from the 1997 AQMP and 1999 Amendment to the Ozone SIP with eleven additional new control measures. In addition, a new transportation conformity budget backstop measure is included in the 2003 AQMP.

One long-term measure for stationary sources is included in the 2003 AQMP. This control measure seeks to achieve additional VOC reductions from stationary sources. The long-term measure is made up of Tier I and Tier II components. Tier I long-term measure has an adoption date between 2005 and 2007 and implementation date between 2007 and 2009 for Tier I. Tier II has an adoption date between 2006 and 2008 and implementation date between 2008 and 2010.

To ultimately achieve ambient air quality standards, additional emission reductions will be necessary beyond the implementation of short-term measures. Long-term measures rely on the advancement of technologies and control methods that can reasonably be expected to occur between 2005 and 2010. Additional stationary source control measures are included in Appendix IV-B of the AQMP, Proposed 2003 State and Federal Strategy for the California SIP. Contingency measures are also included in Appendix IV-Section 2 of the 2003 AQMP.

On June 1, 2007, the SCAQMD adopted the 2007 AQMP in response to the new federal $PM_{2.5}$ and 8-hour ozone standards. The plan focuses on control of sulfur oxides (SO_x), directly emitted $PM_{2.5}$, and nitrogen oxides (NO_x) to achieve the $PM_{2.5}$ standard. Achieving the 8-hour ozone standard builds upon the $PM_{2.5}$ attainment strategy with additional VOC reductions. Control measures proposed by the District for sources under their jurisdiction include facility modernization, energy efficiency and conservation, good management practices, market incentives/compliance flexibility, area source programs, emission growth management and mobile source programs. In addition, CARB has developed a plan of control strategies for sources controlled by CARB (i.e. on-road and off-road motor vehicles and consumer products). The 2007 AQMP now must be approved by CARB prior to being submitted to the U.S. EPA by June 2007.

1.6 Climate

The climate in and around the project area, as with all of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. It maintains moderate temperatures and comfortable humidity, and limits precipitation to a few storms during the winter "wet" season. Temperatures are normally mild, excepting the summer months, which commonly bring substantially higher temperatures. In all portions of the basin, temperatures well above 100 degrees F. have been recorded in recent years. The annual average temperature in the basin is approximately 62 degrees Fahrenheit.

Winds in the project area are usually driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes. At night, the wind generally slows and reverses direction traveling towards the sea. Wind direction will be altered by local canyons, with wind tending to flow parallel to the canyons. During the transition period from one wind pattern to the other, the dominant wind direction rotates into the south and causes a minor wind direction maximum from the south. The frequency of calm winds (less than 2 miles per hour) is less than 10 percent. Therefore, there is little stagnation in the project vicinity, especially during busy daytime traffic hours.

Southern California frequently has temperature inversions which inhibit the dispersion of pollutants. Inversions may be either ground based or elevated. Ground based inversions, sometimes referred to as radiation inversions, are most severe during clear, cold, early winter mornings. Under conditions of a ground-based inversion, very little mixing or turbulence occurs, and high concentrations of primary pollutants may occur local to major roadways. Elevated inversions can be generated by a variety of meteorological phenomena. Elevated inversions act as a lid or upper boundary and restrict vertical mixing. Below the elevated inversion, dispersion is not restricted. Mixing heights for elevated inversions are lower in the summer and more persistent. This low summer inversion puts a lid over the South Coast Air Basin (SCAB) and is responsible for the high levels of ozone observed during summer months in the air basin.

1.7 Monitored Air Quality

Air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates for the SCAB have been made for existing emissions ("2003 Air Quality Management Plan", August 1, 2003). The data indicate that mobile sources are the major source of regional emissions. Motor vehicles (i.e., on-road mobile sources) account for approximately 45 percent of volatile organic compounds (VOC), 63 percent of nitrogen oxide (NO_x) emissions, and approximately 76 percent of carbon monoxide (CO) emissions.

The SCAQMD has divided the SCAB into 38 air-monitoring areas with a designated ambient air monitoring station representative of each area. The Project is in the area represented by measurements made at the Costa Mesa monitoring station. The Costa Mesa station is located near the intersection of Mesa Verde Drive west of Harbor Boulevard approximately 4 miles north of the project site. The air pollutants measured at the Costa Mesa station include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). The air quality data monitored from 2003 to 2006 at the Costa Mesa station is presented in Table 4.

Particulate Matter (PM_{10} and $PM_{2.5}$) is not monitored at the Costa Mesa station. The next nearest monitoring site to the Project is the Mission Viejo monitoring site located east of Los Alisos Boulevard between Jeronimo Road and Trabuco Road approximately 15 miles east of the Project site. The air pollutants measured at the Mission Viejo station include ozone, carbon monoxide (CO), PM_{10} and $PM_{2.5}$. The air quality data monitored from 2003 to 2006 at the Mission Viejo station is presented in Table 5.

The monitoring data presented in Table 4 and Table 5 were obtained from the CARB air quality data website (www.arb.ca.gov/adam/). Federal and State air quality standards are also presented in the Tables.

Table 4
Air Quality Levels Measured at the Costa Mesa Monitoring Station

Pollutant	California Standard	National Standard	Year	% Msrd.[1]	Max. Level	Days State Standard Exceeded[2]	Days National Standard Exceeded[2]
Ozone 1 Hour Average	0.09 ppm	0.12 ppm[4]	2006	100	0.074	0	0
			2005	92	0.085	0	0
			2004	98	0.104	2	0
			2003	100	0.107	4	0
Ozone 8 Hour Average	0.070 ppm	0.08 ppm	2006	100	0.062	--	0
			2005	92	0.072	--	0
			2004	98	0.087	--	1
			2003	100	0.088	--	1
CO 1 Hour Average	20 ppm	35 ppm	2006	98	3.5	0	0
			2005	96	4.1	0	0
			2004	97	4.9	0	0
			2003	97	7.4	0	0
CO 8 Hour Average	9.0 ppm	9 ppm	2006	98	3.0	0	0
			2005	96	3.2	0	0
			2004	97	4.1	0	0
			2003	97	5.9	0	0
NO_2 1 Hour Average	0.18 ppm	None	2006	98	0.101	0	n/a
			2005	86	0.085	0	n/a
			2004	97	0.097	0	n/a
			2003	96	0.107	0	n/a
NO_2 AAM[3]	0.030 ppm	0.053 ppm	2006	98	0.015	n/a	No
			2005	86	0.014	n/a	No
			2004	97	0.016	n/a	No
			2003	96	0.018	n/a	No
SO_2 24 Hour Average	0.04 ppm	0.14 ppm	2006	92	0.005	0	n/a
			2005	94	0.008	0	0
			2004	98	0.008	0	0
			2003	93	0.012	0	0
SO_2 AAM[3]	None	0.030 ppm	2006	92	0.001	n/a	No
			2005	94	0.001	n/a	No
			2004	98	0.002	n/a	No
			2003	93	0.001	n/a	No

1. Percent of year where high pollutant levels were expected that measurements were made
2. For annual averaging times a yes or no response is given if the annual average concentration exceeded the applicable standard. For the PM_{10} 24 hour standard, daily monitoring is not performed. The first number shown in Days State Standard Exceeded column is the actual number of days measured that State standard was exceeded. The second number shows the number of days the standard would be expected to be exceeded if measurements were taken every day.
3. Annual Arithmetic Mean
4. With the implementation of the federal 8-hour ozone standard, the 1-hour standard was revoked as of June 15, 2005. The previous standard is provided for informational purposes.

-- Data Not Reported
n/a – no applicable standard
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 6/6/07

Table 5
Air Quality Levels Measured at the Mission Viejo Monitoring Station

Pollutant	California Standard	National Standard	Year	% Msrd.[1]	Max. Level	Days State Standard Exceeded[2]	Days National Standard Exceeded[2]
Ozone	0.09 ppm	0.12 ppm[4]	2006	97	0.123	12	0
1 Hour			2005	99	0.125	3	1
Average			2004	99	0.116	11	0
			2003	99	0.153	16	4
Ozone	0.070 ppm	0.08 ppm	2006	97	0.105	--	6
8 Hour			2005	99	0.085	--	1
Average			2004	99	0.090	--	4
			2003	99	0.105	--	8
CO	20 ppm	35 ppm	2006	99	1.8	0	0
1 Hour			2005	96	2.2	0	0
Average			2004	97	2.4	0	0
			2003	97	2.5	0	0
CO	9.0 ppm	9 ppm	2006	99	1.6	0	0
8 Hour			2005	96	1.6	0	0
Average			2004	97	1.5	0	0
			2003	97	1.6	0	0
Respirable	50 $\mu g/m^3$	150 $\mu g/m^3$	2006	75	57	1/6	0/0
Particulates			2005	90	41	0/0	0/0
PM_{10}			2004	94	47	0/0	0/0
24 Hour Average			2003	95	64	2/13	0/0
Respirable	20 $\mu g/m^3$	None	2006	75	21	Yes	n/a
Particulates			2005	94	24	Yes	n/a
PM_{10}[5]			2004	95	27	Yes	n/a
AAM[3]			2003	94	31	Yes	n/a
Fine	None	65 $\mu g/m^3$	2006	--	46.9	n/a	0
Particulates			2005	--	35.3	n/a	0
$PM_{2.5}$[5]			2004	--	49.4	n/a	0
24 Hour Average			2003	--	50.6	n/a	0
Fine	12 $\mu g/m^3$	15 $\mu g/m^3$	2006	--	--	--	--
Particulates			2005	--	10.6	No	No
$PM_{2.5}$			2004	--	12.0	No	No
AAM[3]			2003	--	--	--	--

1. Percent of year where high pollutant levels were expected that measurements were made
2. For annual averaging times a yes or no response is given if the annual average concentration exceeded the applicable standard. For the PM_{10} 24 hour standard, daily monitoring is not performed. The first number shown in Days State Standard Exceeded column is the actual number of days measured that State standard was exceeded. The second number shows the number of days the standard would be expected to be exceeded if measurements were taken every day.
3. Annual Arithmetic Mean
4. With the implementation of the federal 8-hour ozone standard, the 1-hour standard was revoked as of June 15, 2005. The previous standard is provided for informational purposes.
5. On September 21, 2006 U.S. EPA announced that it was revoking the annual average PM_{10} standard and lowering the 24-hour $PM_{2.5}$ standard to 35 $\mu g/m^3$. The previous standards are presented as the new standards are not fully implemented at this time.

-- Data Not Reported
n/a – no applicable standard
Source: CARB Air Quality Data Statistics web site www.arb.ca.gov/adam/ accessed 6/6/07

The monitoring data presented in Table 4 and Table 5 show that ozone and particulate matter (PM_{10} and $PM_{2.5}$) are the air pollutants of primary concern in the Project area.

The State 1-hour ozone standard was exceeded 4 days in 2003, 2 days in 2004 and was not exceeded in 2005 or 2006 at the Costa Mesa station. The standard was exceeded between 3 and 16 days each year between 2003 and 2006 at the Mission Viejo station. As of June 15, 2006 the Federal 1-hour ozone standard was revoked with the implementation of the 8- hour standard. The Federal 1-hour ozone standard has not been exceeded in the past four years at the Costa Mesa monitoring station. The Federal 1-hour standard was exceeded 4 days in 2003, 1 day in 2005, and was not exceeded in 2004 and 2006 at the Mission Viejo station

The Federal 8-hour ozone standard was exceeded 1 day each year in 2003 and 2004 but was not exceeded in 2005 or 2006 at the Costa Mesa station. The standard was exceeded between 1 and 8 days each year over the past four years at the Mission Viejo station. The recently adopted State 8-hour ozone standard has also been exceeded, but the CARB website is not currently reporting the total number of days. Based on data presented at the CARB website the State 8-hour ozone standard was not exceeded in 2006, was exceeded 2 days in 2005 and was exceeded at least 4 days each year in 2003 and 2004 at the Costa Mesa Station. The standard was exceeded at least four days each of the past four years at the Mission Viejo Station. The data shows a distinct downward trend in maximum ozone concentrations and number of days with exceedances at the Costa Mesa station. However, at the Mission Viejo station there does not appear to be a trend in either maximum ozone concentrations or days of exceedances in the area.

The State 24-hour concentration standards for PM_{10} was measured to be exceeded 2 days in 2003 and 1 day in 2006 at the Mission Viejo monitoring station. This results in an estimate of 13 days of exceedances in 2003 and 6 days of exceedances in 2006 at the station because PM_{10} monitoring is not performed every day. The State annual average PM_{10} standard has been exceeded each of the past four years at the Mission Viejo Station. The Federal 24-hour PM_{10} standard has not been exceeded in the past four years at the Mission Viejo station. There does not appear to be a noticeable trend in either maximum particulate concentrations or days of exceedances in the area. Particulate levels in the area are due to natural sources, grading operations, and motor vehicles.

The Federal 24 hour standard for $PM_{2.5}$ has not been exceeded in the past four years at the Mission Viejo station. Note that on September 21, 2006 U.S. EPA revised the standard to 35 $\mu g/m^3$. However, since designations for the revised standards will not be made until April 2010 only the number of days exceeding the original standard of 65 $\mu g/m^3$ are reported here.

The State and Federal annual average $PM_{2.5}$ concentration standards were not exceeded bin 2004 and 2005 at the Mission Viejo Station. Complete data is not available for 2003 or 2006. There does not appear to be a noticeable trend in either maximum particulate concentrations or days of exceedances in the area.

The monitored data shown in Table 4 and Table 5 show that other than ozone, PM_{10} and $PM_{2.5}$ exceedances as mentioned above, no State or Federal standards were exceeded for the remaining criteria pollutants.

1.8 Existing Emissions

The project site currently has development that generates air pollutant emissions. The primary source of regional emissions generated by the site is from motor vehicles. The majority of motor vehicle emissions associated with the site are generated off the premises. Emissions generated on-site include the combustion of natural gas for space heating and the generation of electricity.

Land use and trip generation information for the project site was provided by the traffic engineer for the Project, Lindscott, Law, & Greenspan. The existing Hospital development includes 886,270 square feet of building space. The traffic study shows that the Project generates 13,998 daily vehicle trips under existing conditions. Based on the uses and trip length data in the SCAQMD CEQA Air Quality Handbook, the average trip length for the Project is 9.0 miles, this results in 125,892 daily vehicle miles traveled associated with the Hospital.

Table 6 presents the estimated daily pollutant emissions due to the existing hospital operations. A worksheet showing the detailed data used to calculate these emissions is presented in the appendix.

Table 6
Existing (2007) Hospital Emissions

	Pollutant Emissions (lbs/day)					
Source	**CO**	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Vehicular Trips	1,533.1	161.7	303.0	15.8	11.2	1.5
Natural Gas Consumption	2.8	0.7	16.7	0.0	0.0	0.0
On-Site Electrical Generation	73.2	49.5	49.5	14.9	14.7	0.0
Total Area Emissions	**1,609.1**	**212.0**	**369.3**	**30.7**	**26.0**	**1.5**

Note: Total may not equal sum of components exactly due to rounding

Table 7 compares the existing Hospital emissions to the base year (2006) emissions for the South Coast Air Basin presented in the 2003 AQMP. The table shows that the emissions associated with the hospital are a very small fraction, less than 21 thousandths of a percent, of the basin's emissions.

Table 7
Existing Hospital Emissions Compared Regional Emissions

	Pollutant Emissions (tons/day)					
	CO	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Project Emissions	0.805	0.106	0.185	0.015	0.013	0.001
2006 South Coast Air Basin*	3,973	730	950	293	--	60
Project as % of Basin	0.0203%	0.0145%	0.0194%	0.0052%	--	0.0012%

* Source: 2003 AQMP Tables 3-5A & 3-5B

2.0 Potential Air Quality Impacts

Air quality impacts are usually divided into short-term and long-term. Short-term impacts are usually the result of construction or grading operations. Long-term impacts are associated with the built out condition of the proposed Project.

2.1 Thresholds of Significance

2.1.1 Regional Air Quality

In the "1993 CEQA Air Quality Handbook", the SCAQMD has established significance thresholds to assess the regional impact of project related air pollutant emissions. Table 8 presents these significance thresholds. There are separate thresholds for short-term construction and long-term operational emissions. A project with daily emission rates below these thresholds are considered to have a less than significant effect on regional air quality throughout the South Coast Air Basin.

Table 8
SCAQMD Regional Pollutant Emission Thresholds of Significance

	Pollutant Emissions (lbs/day)					
	CO	VOC	NOx	PM_{10}	$PM_{2.5}$	SOx
Construction	*550*	*75*	*100*	*150*	*55*	*150*
Operation	*550*	*55*	*55*	*150*	*55*	*150*

It should be noted that an exceedance of the thresholds presented in Table 8 does not necessarily cause a violation or contribute to a violation of the Ambient Air Quality Standards (AAQS) presented previously in Table 2. The AAQS are in terms of pollutant concentrations, which is a direct measure of the level of exposure to the pollutants. Violations of the AAQS are measured at the ambient air monitoring stations operated by SCAQMD and ARB. The SCAQMD significance thresholds are in terms of total daily of pollutant emissions. Pollutant concentrations are dependent on the amount of pollutant emissions and weather patterns that disperse the emissions.

2.1.2 Local Air Quality

To assess local air quality impacts, the significance thresholds are relative to the State AAQS. Because the area is, technically, in attainment of the CO state standards exceedances of these standards, 20 ppm for 1-hour Carbon Monoxide (CO) concentration levels, and 9 ppm for 8-hour CO concentration levels, result in a significant local air quality impact. If the CO concentration levels with the Project are under the standards, then there is no significant impact. If future CO concentrations with the Project are above these levels, then the Project will have a significant local air quality impact.

2.2 Short-Term Impacts

2.2.1 Construction Air Pollutant Emissions

As discussed previously, the proposed Project does not increase the allowable development and only reallocates the currently approved levels of development for the Hoag Hospital site. No specific projects are proposed. Therefore, a detailed analysis of air quality impacts from construction activities associated with the proposed Project cannot be performed. Temporary impacts will result from Project construction activities. Air pollutants will be emitted by construction equipment, fugitive dust will be generated during grading of the Project site, and Volatile Organic Compounds (VOC – an ozone precursor) will be released during asphalt laying and the application of architectural coatings.

Typically, the greatest levels of air pollutant emissions during construction activities occur during site grading and/or demolition. Operating more than four pieces of the largest heavy construction equipment for 8 hours a day or 6 to 8 pieces of smaller equipment will generate NO_x emissions in excess of the SCAQMD's 100 pounds per day significance threshold. Actively disturbing more than 13.4 acres of exposed soil per day will generate PM_{10} emissions greater than the 150 pounds per day significance threshold even when site watering is performed. During demolition, heavy equipment is used, the demolition activities generate PM_{10} emissions and debris haul trucks generate considerable emissions. Heavy trucks traveling more than 2,500 vehicle miles, 50 trips with a 25 mile one way trip length, generate NO_x emissions greater than the 100 pounds per day threshold. For NO_x emissions to remain below the significance threshold, truck trips would need to be limited more than this, because the combined emissions from the trucks and heavy equipment would need to be lower than the threshold. Therefore, it is possible that grading and demolition activities resulting from the Project would generate PM_{10} $PM_{2.5}$ and NOx emissions greater than the SCAQMD thresholds and result in a significant air quality impact. Mitigation is discussed in Section 3.1.

Final EIR No. 142 prepared and certified in 1991 to assess the environmental impacts of the currently approved Master Plan for Hoag Hospital. The air quality analysis for Final EIR No. 142 found that emissions due to construction activities associated with the development of the Master Plan would result in a significant air quality impact. Because the Project does not change the allowable development of the Hoag Hospital site, the impact of air pollutant emissions with the Proposed Project would not be expected to change significantly from development currently approved.

Other considerable emissions that can occur on a short-term basis include the off-gas (evaporative) emissions of VOC from the application of architectural coatings (e.g.; painting) and off-gas emissions of VOC from asphalt paving. Based on the emission factor of 2.62 pounds per acre of asphalt paving (from URBEMIS2002), up to 28.6 acres could be paved daily without exceeding the threshold. It is unlikely that this amount of paving would be required at the hospital. Therefore, asphalt paving would likely not result in a significant air quality impact.

Based on the emission factor of 0.0185 pounds per square foot of painted surface (from URBEMIS2002) only 4,054 square feet or less of surface could be painted each day without exceeding the threshold. This is only approximately 500 linear feet of an 8 foot high surface. It is unlikely that painting would be limited to this amount. However, the emission factor used in this calculation assumes the use of paint with the highest VOC content available for use in the South Coast Air Basin and the most inefficient method of application. However it is still likely that VOC emissions during application of architectural coatings would exceed the 75 lbs./day significance threshold. Therefore, it is likely that painting activities resulting from the Project would result in a significant air quality impact. Mitigation is discussed in Section 3.1.

SCAQMD has developed a methodology to assess the localized impacts of emissions from within a project site (SCAQMD, Draft Localized Significance Threshold Methodology, June 19, 2003). SCAQMD recommends, but does not require, comparing projects to localized significance thresholds (LSTs). The LST's were developed to analyze the significance of potential local air quality impacts of projects and provides screening tables for smaller projects, in which emissions may be less than the mass daily emission thresholds analyzed above. The SCAQMD also recommends project-specific air quality modeling for larger projects. Depending on the size and location of specific construction projects relative to sensitive receptors it is possible that individual projects will have a significant short-term localized impact for NO_2, PM_{10}, and $PM_{2.5}$. Therefore, the proposed Project could have a significant impact on local air quality during construction. Mitigation is discussed in Section 3.1.

In 1998, the California Air Resources Board (ARB) identified particulate matter from diesel-fueled engines (Diesel Particulate Matter or DPM) as a Toxic Air Contaminant (TAC). The majority of the heavy construction equipment utilized during construction will be diesel fueled and emit DPM. Impacts from toxic substances are related to cumulative exposure and are assessed over a 70-year period. Cancer risk is expressed as the maximum number of new cases of cancer projected to occur in a population of one million people due to exposure to the cancer-causing substance over a 70-year lifetime (California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Guide to Health Risk Assessment.) Because of the relatively short duration of construction compared to a 70-year lifespan, diesel emissions resulting from the construction of the Project are not expected to result in a significant impact.

2.3 Long-Term Impacts

2.3.1 Local Air Quality Project Impacts

While the Project is projected to result in fewer vehicle trips than the currently approved Master Plan, the Project will change traffic distribution patterns which will increase traffic volumes at some intersections. Increased traffic volumes result in increased pollutant emissions in the vicinity of these intersections, which can cause pollutant levels to exceed the ambient air quality standards. Carbon monoxide (CO) is the pollutant of major concern along roadways because the most notable source of carbon monoxide is motor vehicles. For this reason carbon monoxide concentrations are usually indicative of the local air quality generated by a roadway network, and are used as an indicator of its impacts on local air quality. CO concentrations are highest near intersections where queuing increases emissions. Local air quality impacts can be assessed by comparing future carbon monoxide levels with State and Federal carbon monoxide standards moreover by comparing future CO concentrations with and without the Project. The Federal and State standards for carbon monoxide were presented earlier in Table 2.

CO modeling was performed for the 2005 CO Resignation Request and Maintenance Plan to demonstrate attainment of the federal CO standards. Modeling was performed for four intersections considered the worst-case intersections in the South Coast Air Basin. These intersections included, Wilshire at Veteran, Sunset at Highland, La Cienega at Century, and Long Beach at Imperial. Table 4-10 of Attachment 2 of the 2005 CO Resignation Request and Maintenance Plan shows that modeled 1-hour average concentrations at these four intersections for 2002 conditions are actually below the 8-hour standard of 9 ppm. The highest modeled 1-hour average concentration of 4.6 ppm occurred at the Wilshire and Veteran intersection. None of the intersections in the Project area have peak hour traffic volumes that exceed those at the intersections modeled in the AQMP nor do they have any geometric qualities that would result in higher concentrations than for the intersections modeled for the AQMP. Generally, only intersections operating at LOS of D or worse are considered to have the potential to cause CO concentrations to exceed the state ambient air quality standards of 20 ppm for a 1-hour averaging time and 9 ppm for an 8-hour averaging time.

Compared to the future conditions with the approved Master Plan, the Project is projected to increase total traffic volumes traveling through the intersection during peak hours at only four intersections; (1) Superior Avenue at Hospital Road, (2) Hoag Drive/Placentia Avenue at Hospital Road, (3) Superior Avenue at 16th Street/Industrial Way, and (4) Superior Avenue at 17th Street. All four of these intersections are projected to operate with a Level of Service (LOS) of C or better with the Project for the peak period where the Project is projected to increase the volume. (Superior Avenue at 17th Street is shown to have an A.M. Peak hour LOS of E for Existing and 2015 conditions with and without the Project and LOS D for 2025 conditions with and without the Project, but the Project is not projected to affect the A.M. Peak Hour traffic volume at this intersection.) The Project is not projected to affect the LOS at these intersections compared to future conditions with the approved Master Plan. Peak hour traffic volume increases due to the Project are less than 5 percent for all four intersections and would not be expected to alter CO concentrations significantly.

Compared to the conditions with the approved Master Plan, the Project Alternative is projected to increase total traffic volumes traveling through the intersection during peak hour at the same four intersections as the Project and one additional intersection; Placenta Avenue at Superior Avenue. All five of these intersections are projected to operate with a Level of Service (LOS) of C or better with the Project Alternative for the peak period where the Project Alternative is projected to increase the volume. (Superior Avenue at 17th Street is shown to have an A.M. Peak hour LOS of E for Existing and 2015 conditions with and without the Project Alternative and LOS D for 2025 conditions with and without the Project Alternative, but the Project Alternative is not projected to affect the A.M. Peak Hour traffic volume at the intersection.) The Project Alternative is not projected to affect the LOS at these intersections compared to conditions with the approved Master Plan. Peak hour traffic volume increases due to the Project Alternative are less than 5 percent for all five intersections and would not be expected to alter CO concentrations significantly.

Based on the modeling from the AQMP and the fact that neither the Project nor the Project Alternative will substantially affect intersection operation, in terms of CO generation, all intersections in the vicinity would not be expected to experience CO concentrations in excess of the state standards. Further, neither the Project nor the Project Alternative would result in any changes in air pollutant emissions from stationary on-site sources that could affect local air quality in the vicinity of the Hospital. Therefore, neither the Project nor the Project Alternative will result in a significant local air quality impact.

2.3.2 Regional Air Quality

The primary source of regional emissions generated by Hoag Hospital operations is from motor vehicles. Other emissions are generated from the combustion of natural gas for space and water heating and the on-site generation of electricity at the cogeneration facility on the campus. Air pollutant emissions for future conditions with and without the Project were calculated and are presented below. The emissions were calculated using the guidance presented in the SCAQMD CEQA Air Quality Handbook and information presented on the SCAQMD CEQA Air Quality Handbook web site (http://www.aqmd.gov/ceqa/hdbk.html).

Emission factors from EMFAC2007 published by the SCAQMD on their CEQA Air Quality Handbook web site were used to estimate vehicular emissions. EMFAC2007 is a computer program generated by the California Air Resources Board that calculates emission rates for vehicles. The average trip length for the Project was calculated to be 9.0 miles. This is a composite trip length derived from data contained in the 1993 SCAQMD CEQA Air Quality Handbook (Page 9-24).

The data used to estimate the on-site combustion of natural gas are based on the proposed land uses in terms of building square footages, and emission factors taken from the SCAQMD 1993 CEQA Air Quality Handbook. The hospital operates a cogeneration facility that generates electricity from natural gas extracted from the ground. At present, three engine/generators generate 1,475 kilowatts of electricity and three generators are planned to be added in the future that will generate 2,950 kilowatts of electricity. Emissions from these generators were calculated based on the maximum permissible emission rates allowed by the SCAQMD permits for the units.

Land use and trip generation information for each of the three scenarios analyzed were provided by the traffic engineer for the Project, Linscott, Law & Greenspan. Emissions presented below were calculated for the earliest expected buildout year of the Project, 2015. As vehicular emissions are projected to be reduced in future years, due to more vehicles complying with more stringent air pollution emission standards, consideration of the earliest buildout year of the Project results in the highest emissions generation by the Project

$PM_{2.5}$ emissions due to natural gas combustion were calculated using the methodology presented in SCAQMD's "Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM2.5 Significance Thresholds" (October 2006). The PM_{10} emissions were calculated using the above methodologies and then multiplying the PM_{10} emissions by the applicable $PM_{2.5}$ fraction derived from emission source, using PM profiles in the California Emission Inventory Data and Reporting System (CEIDRS) developed by CARB. This data indicates that $PM_{2.5}$ emissions are 0.990 times PM_{10} emissions.

Future Emission With Existing Development

Air pollutant emissions from the existing Hoag Hospital facilities will decrease in the future from the levels presented previously in Table 6. This is due to projected reductions in vehicular emissions due to more vehicles complying with more stringent air pollution emission standards. Emissions related to natural gas consumption and electrical generation are not projected to change. The impact of the Project is measured against the change in emissions resulting from the implementation of the Project. Therefore, the emissions from the existing facilities are subtracted from the total facility emissions with the Project to determine the change caused by the Project.

Table 9 presents the estimate of emissions from the Hospital in 2015 if no additional development is performed and represent the baseline emissions for analyzing the impacts of the Project. The total emissions presented on the last row of Table 9 are subtracted from the With-Project emission calculations presented below to determine the change in emissions due to the Project. This change in emissions is compared to the SCAQMD significance thresholds presented in Table 8 to determine the significance of the changes resulting from the Project.

Table 9
2015 Existing Hospital Development Emissions

	Pollutant Emissions (lbs/day)					
Source	**CO**	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Vehicular Trips	808.1	90.3	152.9	14.2	9.8	1.5
Natural Gas Consumption	2.8	0.7	16.7	0.0	0.0	0.0
On-Site Electrical Generation	73.2	49.5	49.5	14.9	14.7	0.0
Total Area Emissions	**884.1**	**140.6**	**219.1**	**29.1**	**24.5**	**1.5**

Note: Total may not equal sum of components exactly due to rounding

Emission Increases With Previously Approved Development

The approved Master Plan for the Hospital allows for development of a total of 1,343,238 square feet of building space independent of approval of the Proposed Project. The traffic study shows that under this scenario, the Hospital is projected to generate 27,152 daily vehicle trips. This results in 244,368 daily vehicle miles traveled associated with the Hospital when developed under the approved Master Plan. In addition, current plans will add three additional generator units to the cogeneration facility. Table 10 presents the estimate of emissions from the Hospital in 2015 with the currently approved development. A worksheet showing the detailed data used to calculate these emissions is presented in the appendix.

Table 10
2015 Hospital Emissions With Approved Development

	Pollutant Emissions (lbs/day)					
Source	**CO**	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Vehicular Trips	1,568.5	175.3	296.7	27.6	19.0	2.8
Natural Gas Consumption	4.2	1.1	25.4	0.0	0.0	0.0
On-Site Electrical Generation	146.5	99.1	99.1	29.7	29.4	0.0
Total Area Emissions	**1,719.2**	**275.5**	**421.2**	**57.4**	**48.5**	**2.8**

Note: Total may not equal sum of components exactly due to rounding

Table 11 presents the increase in emissions associated with the development of the Hospital under the currently approved development plans. The emissions with existing development in 2015 from Table 9 and with approved development from Table 10 are presented and the increase due to the additional currently approved development is shown. The SCAQMD thresholds are also presented.

Table 11
2015 Emissions Increase With Approved Development

	Pollutant Emissions (lbs/day)					
Condition	**CO**	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Existing Uses in 2015	884.1	140.6	219.1	29.1	24.5	1.5
Future Without Project	1,719.2	275.5	421.2	57.4	48.5	2.8
Change In Emissions	**835.1**	**134.9**	**202.0**	**28.3**	**23.9**	**1.4**
SCAQMD Thresholds	550	55	55	150	55	150

Note: Change may not equal difference of components exactly due to rounding

Table 11 shows that, without the proposed Project, the increases in CO, VOC and NO_x emissions associated with the currently approved development of the Hospital are projected to exceed the SCAQMD thresholds of significance. This shows that the development of the existing Master Plan would result in a significant air quality impact using the SCAQMD thresholds. At the time the analysis for Final EIR No. 142, the 1991 EIR prepared and certified for the currently approved Master Plan for the Hospital, was prepared, SCAQMD had not published these thresholds. The air quality analysis in Final EIR No. 142 found that the development of the Master Plan would not have a significant regional air quality impact by itself. Cumulative air quality impacts were found to be significant and unavoidable. The finding of no significant impact for the Master Plan was reached by comparing the Hospital emissions with regional emissions for the South Coast Air Basin and Source Receptor Area 18. The analysis concluded that since the Hospital represented such a small portion of regional emissions that it did not result in a significant impact. However, CO, VOC, and NO_x emissions projected in the Final EIR No. 142 were greater than the SCAQMD significance thresholds established in the 1993 SCAQMD CEQA Air Quality Handbook.

Air Pollutant emissions from the Hospital operations with the Master Plan presented in the Final EIR No. 142 were greater than those presented in Table 10 for all pollutants except VOC. CO and NO_x emissions are projected to be 3 to 7 percent lower in Table 10 than they were in the Final EIR No. 142, and VOC emissions are projected to be 92% higher than in Final EIR No. 142. These differences are due to multiple factors. Vehicular emission factors and emission factors due to on site natural gas combustion have been updated since 1991. The cogeneration facility emissions included in the emission estimate presented above were not directly included in Final EIR No. 142. Vehicular trip generation and trip length estimates for the Hospital in 1991 are different from the estimates used to estimate emissions presented in Table 10. The current trip length values are derived from the SCAQMD Air Quality Handbook which was published in 1993, prior to Final EIR No. 142 and trip generation rates have undergone several refinements since that time.

Table 11 shows that the development of the Master Plan results in a significant air quality impact when compared to the SCAQMD significance thresholds, including potential human health implications associated with each of the subject pollutants (see discussion of effects of pollutants on health in Section 1.3). Mitigation is discussed in Section 3.2.

Emission Increases With Project

In 2015, with the Project, the Hospital is projected to have 1,343,238 square feet of building space, the same as the existing Master Plan. The traffic study shows that with the full transfer of 225,000 square feet from the lower campus to the upper campus, the Hospital is projected to generate 22,801 daily vehicle trips. This results in 205,209 daily vehicle miles traveled associated with the Hospital under these conditions. This represents 16% reduction in trips and vehicle miles traveled with the Proposed Project compared to the existing Master Plan. This level of reduction would only be experienced if the full 225,000 square feet were transferred from the lower campus to the upper campus. The Project only proposes to allow for transferring this amount of development but does not require the transfer. If less development were transferred, the reduction in trips would be less, to the point where, if no area is transferred, the trip generation would be the same as the Master Plan and emissions would be the same as presented above in Table 10 and result in the air pollutant emission increases shown in Table 11.

Table 12 presents the estimate of emissions from the Hospital in 2015 with the full transfer of 225,000 square feet from the lower campus to the upper campus. A worksheet showing the detailed data used to calculate these emissions is presented in the appendix.

Table 12
2015 Emissions With Project*

	Pollutant Emissions (lbs/day)					
Source	**CO**	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Vehicular Trips	1,317.2	147.2	249.2	23.2	16.0	2.4
Natural Gas Consumption	4.2	1.1	25.4	0.0	0.0	0.0
On-Site Electrical Generation	146.5	99.1	99.1	29.7	29.4	0.0
Total Area Emissions	**1,467.9**	**247.4**	**373.6**	**53.0**	**45.4**	**2.4**

* Assumes full transfer of 225,000 square feet from lower campus to upper campus
Note: Total may not equal sum of components exactly due to rounding

Table 13 presents the increase in emissions associated with the development of the Hospital with the proposed Project. The emissions from the Hospital for existing conditions from Table 9 and with the Project from Table 12 are presented and the increase due to the Project is shown. The SCAQMD thresholds are also presented.

Table 13
Emissions Increase With Project Over Existing Conditions

Condition	Pollutant Emissions (lbs/day)					
	CO	VOC	NO_x	PM_{10}	$PM_{2.5}$	SO_x
Existing Uses in 2015	884.1	140.6	219.1	29.1	24.5	1.5
Future With Project*	1,467.9	247.4	373.6	53.0	45.4	2.4
Change In Emissions	**583.8**	**106.8**	**154.5**	**23.8**	**20.9**	**0.9**
SCAQMD Thresholds	550	55	55	150	55	150

* Assumes full transfer of 225,000 square feet from lower campus to upper campus
Note: Change may not equal difference of components exactly due to rounding

Table 13 shows that the increase in CO, VOC and NO_x emissions associated with the development of the Project over existing conditions are projected to exceed the SCAQMD threshold of significance. Therefore, the development of the Master Plan as modified by the Project will result in a significant air quality impact for CO, VOC, and NO_x, including potential human health implications associated with each of these pollutants (see discussion of effects of pollutants on health in Section 1.3). Mitigation is discussed in Section 3.2.

Table 14 presents the change in emissions associated with the development of the Hospital with the proposed Project, assuming the full transfer of 225,000 square feet from the lower campus to the upper campus, compared to future conditions without the Project (i.e., with the current Master Plan). The Hospital emissions for future conditions with currently approved development (Future Without Project) from Table 10 and with the Project from Table 12 are presented and the change due to the Project is shown. The SCAQMD thresholds are also presented.

Table 14
Future Emissions Change Due to Project

Condition	Pollutant Emissions (lbs/day)					
	CO	VOC	NO_x	PM_{10}	$PM_{2.5}$	SO_x
Future Without Project	1,719.2	275.5	421.2	57.4	48.5	2.8
Future With Project*	1,467.9	247.4	373.6	53.0	45.4	2.4
Change In Emissions	**-251.4**	**-28.1**	**-47.6**	**-4.4**	**-3.0**	**-0.5**
SCAQMD Thresholds	550	55	55	150	55	150

* Assumes full transfer of 225,000 square feet from lower campus to upper campus
Note: Change may not equal difference of components exactly due to rounding

Table 14 shows that the Project will result in lower emissions than future conditions without the Project. This is due to the projected reduction in Hospital vehicle trips with the Project shown in the traffic study. Note that the reductions shown only occur if the full 225,000 square feet is transferred from the lower campus to the upper campus. Lower reductions would occur with less area transferred, to the point where, if no area is transferred, the emissions would not change from those with the approved Master Plan presented in Table 11. Transferring the full 225,000 square feet would reduce the projected CO, VOC and NO_x emission increases over existing conditions by between 6% and 15% compared to future conditions with currently approved development. Therefore, the Project, when considered by itself, does not result in a significant impact. However, the development of the Master Plan, even as modified by the Project will result in a significant impact by virtue of exceeding certain of the SCAQMD thresholds as discussed above.

Table 15 compares the Hospital emissions with the Project to the 2020 emissions projected for the South Coast Air Basin presented in the 2003 AQMP. The table shows that the emissions associated with the Hospital with the proposed Project are a very small fraction, less than 36 thousandths of a percent, of the basin's emissions.

Table 15
Hospital Emissions With Project Compared Regional Emissions

	Pollutant Emissions (tons/day)					
	CO	VOC	NO_x	PM_{10}	$PM_{2.5}$	SO_x
Hospital Emissions w/ Proj.	0.734	0.124	0.187	0.026	0.023	0.001
2020 South Coast Air Basin*	2,414	584	532	318	--	76
Project as % of Basin	0.0304%	0.0212%	0.0351%	0.0083%	--	0.0016%

* Source: 2003 AQMP Tables 3-5A & 3-5B

Emission Increases With Project Alternative

In 2015, with the Project Alternative, the Hospital is projected to have 1,343,238 square feet of building space, the same as the existing Master Plan. The traffic study shows that with the full transfer of 150,000 square feet from the lower campus to the upper campus, the Hospital is projected to generate 25,365 daily vehicle trips. This results in 228,285 daily vehicle miles traveled associated with the Hospital under these conditions. This represents 6.6% reduction in trips and vehicle miles traveled with the Project Alternative compared to the existing Master Plan. This level of reduction would only be experienced if the full 150,000 square feet were transferred from the lower campus to the upper campus. The Project Alternative only proposes to allow for transferring this amount of development but does not require the transfer. If less development were transferred, the reduction in trips would be less, to the point where, if no area is transferred, the trip generation would be the same as the Master Plan and emissions would be the same as presented above in Table 10 and result in the air pollutant emission increases shown in Table 11.

Table 16 presents the estimate of emissions from the Hospital in 2015 with the full transfer of 150,000 square feet from the lower campus to the upper campus. A worksheet showing the detailed data used to calculate these emissions is presented in the appendix.

Table 16
2015 Emissions With Project Alternative*

	Pollutant Emissions (lbs/day)					
Source	CO	VOC	NO_x	PM_{10}	$PM_{2.5}$	SO_x
Vehicular Trips	1,465.3	163.8	277.2	25.8	17.8	2.6
Natural Gas Consumption	4.2	1.1	25.4	0.0	0.0	0.0
On-Site Electrical Generation	146.5	99.1	99.1	29.7	29.4	0.0
Total Area Emissions	**1,616.0**	**263.9**	**401.6**	**55.6**	**47.2**	**2.6**

* Assumes full transfer of 150,000 square feet from the lower campus to the upper campus
Note: Total may not equal sum of components exactly due to rounding

Table 17 presents the increase in emissions associated with the development of the Hospital with the proposed Project Alternative. The emissions from the Hospital for existing conditions from Table 9 and with the Project Alternative from Table 16 are presented and the increase due to the Project Alternative is shown. The SCAQMD thresholds are also presented.

Table 17
Emissions Increase With Project Alternative Over Existing Conditions

	Pollutant Emissions (lbs/day)					
Condition	**CO**	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Existing Uses in 2015	884.1	140.6	219.1	29.1	24.5	1.5
Future With Alternative	1,616.0	263.9	401.6	55.6	47.2	2.6
Change In Emissions	**731.9**	**123.4**	**182.5**	**26.4**	**22.7**	**1.2**
SCAQMD Thresholds	550	55	55	150	55	150

Note: Change may not equal difference of components exactly due to rounding

Table 17 shows that the increase in CO, VOC and NO_x emissions associated with the development of the Project Alternative over existing conditions are projected to exceed the SCAQMD threshold of significance. Therefore, the development of the Master Plan as modified by the Project Alternative will result in a significant air quality impact for CO, VOC, and NO_x, including potential human health implications associated with each of these pollutants (see discussion of effects of pollutants on health in Section 1.3). Mitigation is discussed in Section 3.2.

Table 18 presents the change in emissions associated with the development of the Hospital with the proposed Project Alternative, assuming the full transfer of 150,000 square feet from the lower campus to the upper campus compared to future conditions without the Project (i.e., with the current Master Plan). The Hospital emissions for future conditions with currently approved development (Future Without Project) from Table 11 and with the Project Alternative from Table 16 are presented and the change due to the Project Alternative is shown. The SCAQMD thresholds are also presented.

Table 18
Future Emissions Change Due to Project Alternative

	Pollutant Emissions (lbs/day)					
Condition	**CO**	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Future Without Project	1,719.2	275.5	421.2	57.4	48.5	2.8
Future With Alternative*	1,616.0	263.9	401.6	55.6	47.2	2.6
Change In Emissions	**-103.2**	**-11.5**	**-19.5**	**-1.8**	**-1.3**	**-0.2**
SCAQMD Thresholds	550	55	55	150	55	150

* Assumes full transfer of 150,000 square feet from lower campus to upper campus
Note: Change may not equal difference of components exactly due to rounding

Table 18 shows that the Project Alternative will result in lower emissions than future conditions with the approved Master Plan. This is due to the reduction in Hospital vehicle trips projected with the Project Alternative by the traffic study. Note that the reductions shown only occur if the full 150,000 square feet is transferred from the lower campus to the upper campus. Lower reductions would occur with less area transferred, to the point that if no area is transferred, the emissions would not change from those with the approved Master Plan presented in Table 11.

Transferring the full 150,000 square feet would reduce the projected CO, VOC and NO_x emission increases over existing conditions by between 3% and 7% compared to future conditions with currently approved development. Therefore, the Project Alternative, when considered by itself, does not result in a significant impact. However, the development of the Master Plan, even as modified by the Project Alternative will result in a significant impact by virtue of exceeding certain of the SCAQMD thresholds as discussed above.

Table 19 compares the Hospital emissions with the Project Alternative to the 2020 emissions projected for the South Coast Air Basin presented in the 2003 AQMP. The table shows that the emissions associated with the Hospital with the Project Alternative are a very small fraction, less than 38 thousandths of a percent, of the basin's emissions.

Table 19
Hospital Emissions With Project Alternative Compared Regional Emissions

	Pollutant Emissions (tons/day)					
	CO	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Hospital Emissions w/ Alt.	0.808	0.132	0.201	0.028	0.024	0.001
2020 South Coast Air Basin*	2,414	584	532	318	--	76
Project as % of Basin	0.0335%	0.0226%	0.0377%	0.0087%	--	0.0017%

* Source: 2003 AQMP Tables 3-5A & 3-5B

Summary

The increase in emissions associated with the development of the Master Plan as modified by the Project or the Project Alternative compared to existing development are projected to exceed the SCAQMD thresholds of significance (as would the existing approved development even in the absence of the Proposed Project or Project Alternative). Note also that these thresholds are not necessarily an appropriate reference to determine the significance of Project emissions. These thresholds are taken from the "1993 CEQA Air Quality Handbook", which states that the criteria "are consistent with the federal Clean Air Act definition of a significant source in an area classified as extreme for ozone." While it is correct that the thresholds are consistent as such, the Handbook does not acknowledge such criteria were developed initially by the U.S. EPA to be applied to point source emissions, such as an industrial smokestack. Comparisons between emissions from an extreme point source and emissions from the Hospital are clearly inappropriate in this context. Emissions from the Hospital are primarily from motor vehicles traveling in the area. Emissions from the Hospital bear no resemblance to emissions from industrial sources.

In spite of the original intent and application of SCAQMD's thresholds, SCAQMD has recommended their application to emissions generated by a proposed project, including vehicle emissions, and therefore, the change in emissions resulting from the project is compared with them per the SCAQMD's CEQA Air Quality Handbook. Since the increase in daily emissions of CO, VOC and NO_x due to the Project will exceed the significance thresholds presented in the SCAQMD CEQA Handbook, the development of the Master Plan as modified by the Project or the Project Alternative, is considered to have significant long-term impacts, including potential human health implications associated with each of the subject pollutants (see discussion of effects of pollutants on health in Section 1.3). As a result, mitigation measures are recommended for long-term impacts. Mitigation measures are discussed in Section 3.2.

The Master Plan modified by both the Project and the Project Alternative result in emission reductions when compared with the currently approved Master Plan assuming full transfer of the proposed square footage from the lower campus to the upper campus. If no area is transferred, the emissions would be the same. Greater reductions would be experienced with the Project over the Project Alternative. The reduction in CO, VOC and NO_x emissions with the Project are 2.4 times more than the reductions with the Project Alternative due to the greater reduction in vehicle trips. Table 20 shows the emissions from the entire Hospital with the development of the Project and with the Project Alternative. The last row of the table shows the increase in emissions with the Project alterative. The Project Alternative would result in CO, VOC, and NO_x emissions between 4.2% and 6.0% higher than emissions with the Project

Table 20
Difference In Emissions With Project vs. Project Alternative

	Pollutant Emissions (lbs/day)					
Condition	**CO**	**VOC**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**
Future With Project	1,467.9	247.4	373.6	53.0	45.4	2.4
Future With Alternative	1,616.0	263.9	401.6	55.6	47.2	2.6
Increase With Alternative	**148.1**	**16.6**	**28.0**	**2.6**	**1.8**	**0.3**

Note: Increase may not equal difference of components exactly due to rounding

2.4 Compliance with Air Quality Planning

The following sections deal with the major air planning requirements for this Project. Specifically, consistency of the Project with the AQMP is addressed. As discussed below, consistency with the AQMP is a requirement of the California Environmental Quality Act (CEQA).

2.4.1 Consistency with AQMP

An EIR must discuss any inconsistencies between the proposed Project and applicable GPs and regional plans (California Environmental Quality Act (CEQA) guidelines (Section 15125)). Regional plans that apply to the proposed Project include the South Coast Air Quality Management Plan (AQMP). In this regard, this section will discuss any inconsistencies between the proposed Project with the federally-approved applicable AQMP.

The purpose of the consistency discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the Project would interfere with the region's ability to comply with Federal and State air quality standards. If the decision-makers determine that the project is inconsistent, the lead agency may consider project modifications or inclusion of mitigation to eliminate the inconsistency.

The SCAQMD's CEQA Handbook states that "New or amended GP Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP." Strict consistency with all aspects of the plan is usually not required. A proposed project should be considered to be consistent with the plan if it furthers one or more policies and does not obstruct other policies. The Handbook identifies two key indicators of consistency:

(1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP (except as provided for CO in Section 9.4 for relocating CO hot spots).

(2) Whether the project will exceed the assumptions in the AQMP in 2010 or increments based on the year of project buildout and phase.

Both of these criteria are evaluated in the following sections.

Criterion 1 - Increase in the Frequency or Severity of Violations?

Based on the air quality analysis contained in this report, there will be significant short-term construction and long-term operational impacts due to the Project and Project Alternative based on the SCAQMD thresholds of significance. That is, air pollutant emissions from construction activities associated with the project may be greater than the SCAQMD thresholds, and air pollutant emissions associated with the operation of the Hospital will increase more than the SCAQMD thresholds with the Project or the Project Alternative. However, as discussed previously, emissions greater than the SCAQMD thresholds do not necessarily result in air pollutant concentrations greater than the Ambient Air Quality Standards (AAQS). The analysis shows that the Hospital emissions are projected to be only a small fraction of the basin wide emissions. It is unlikely that emission increases due to the project would considerably affect monitored air pollutant concentrations at the nearest ambient air monitoring stations where violations of the AAQS would be recorded.

The analysis for long-term local air quality impacts showed that local pollutant concentrations are not projected to exceed any of the AAQS. The analysis for short-term construction impacts concluded that it is possible that construction activities could result in local pollutant concentrations in the immediate vicinity of the construction activities exceeding the AAQS. However, this exceedance would be localized to the area immediately surrounding the construction area and would not translate to a violation of the AAQS measured at nearby air monitoring stations.

Neither the Project nor the Project Alternative is projected to increase the frequency or severity of violations of the AAQS, thus the Project and Project Alternative are found to be consistent with the AQMP for the first criterion.

Criterion 2 - Exceed Assumptions in the AQMP?

Consistency with the AQMP assumptions is determined by comparing the Project's population, housing and employment growth with the growth assumptions in the AQMP. Thus, the emphasis of this criterion is to insure that the Project growth and associated emissions do not exceed those assumed as a basis for the AQMP. AQMP growth assumptions are based upon the General Plans for the Cities in the Basin. The currently approved development at the Hospital is included in the City's General Plan and therefore is the basis for the AQMP growth assumptions.

Table 14 and Table 18 show that emissions with the Project and Project Alternative will be lower than with the development of the currently approved development for the Project in the City's General Plan, primarily due to a reduction in Project vehicle trips. Since the AQMP predictions are based on the General Plan and the Project will result in emissions reductions for all pollutants, the Project is consistent with the AQMP assumptions.

2.5 Comparison with Final EIR No. 142

Final EIR No. 142 prepared and certified in 1991 to assess the environmental impacts of the currently approved Master Plan for Hoag Hospital. Final EIR No. 142 was prepared prior to the publication of the SCAQMD's CEQA Air Quality Handbook and the significance thresholds presented in the handbook. As discussed above in Section 3.2, the development of the Master Plan, in Final EIR No. 142, was found to not have a significant regional air quality impact by comparing the Hospital emissions with regional emissions for the South Coast Air Basin and Source Receptor Area 18. The analysis concluded that since the Hospital emissions represented such a small portion of regional emissions that it did not result in a significant impact. However, CO VOC and NO_x emissions projected in Final EIR No. 142 were greater than the SCAQMD significance thresholds (as stated previously, the SCAQMD significance thresholds were not adopted until after EIR No. 142 was certified). Final EIR No. 142 did find that the Master Plan would result in a significant and unavoidable cumulative air quality impact.

Emissions with the Master Plan (approved development) presented in EIR No. 142 were greater than those presented in Table 10 for all pollutants except VOC. CO and NO_x emissions are projected to be 3 to 7 percent lower in Table 10 than they were in Final EIR No. 142 and VOC emissions are projected to be 92% higher than in Final EIR No. 142. These differences are due to revisions to vehicular emission factors and emission factors due to on site natural gas combustion and inclusion of the cogeneration facility emissions in the data presented in Table 10. Vehicular trip generation and trip length estimates for the Hospital when Final EIR No. 142 was prepared are different from the current values. The current trip length values are derived from the SCAQMD Air Quality Handbook, which was published in 1993, prior to Final EIR No. 142, and trip generation rates have undergone several refinements since that time. Table 11 shows that the increases in emissions from Hospital Activity with the development of the Master Plan are greater than the SCAQMD significance thresholds for CO, VOC and NO_x. Therefore, development of the Master Plan results in a significant air quality impact.

Emissions with the Project or Project Alternative are lower than with the approved Master Plan. However, the reductions do not reduce emission increases from existing conditions to below the SCAQMD significance thresholds for CO, VOC, and NO_x. Therefore, the development of the Master Plan as modified by either the Project or the Project Alternative results in a significant air quality impact.

Final EIR No. 142 found that emissions due to construction activities associated with the development of the Master Plan would result in a significant air quality impact; likewise construction impacts with the Project or Project Alternative would also result in a significant air quality impact,

Previously Adopted Mitigation Measures

The following is a list of Mitigation Measures adopted in Final EIR No. 142. The Hospital will be required to comply with all of these measures for all future development except as noted.

37. Prior to the issuance of grading and building permits for each phase of development, the project proponent shall provide evidence for verification by the Planning Department that energy efficient lighting has been incorporated into the Project design.

82. Before the issuance of building permits, the Project Sponsor shall submit plans to the Building Department, City of Newport Beach, demonstrating compliance with all applicable District Rules, including Rule 401, Visible Emissions, Rule 402, Public Nuisance, and Rule 403, Fugitive Dust.

88. The Project Sponsor shall submit plans to the City Building Department prior to the issuance of a building permit for each phase of development, verifying that energy efficiency will be achieved by incorporating appropriate technologies and systems into future structures, which may include:
    - High efficiency cooling/absorption units
    - Thermal storage and ceramic cooling towers
    - Cogeneration capabilities
    - High efficiency water heaters
    - Energy efficient glazing systems
    - Appropriate off-hour heating/cooling/lighting controls
    - Time clocks and photovoltaic cells for lighting controls
    - Efficient insulation systems
    - Light colored roof and building exteriors
    - PL lighting and fluorescent lighting systems
    - Motion detector lighting controls
    - Natural interior lighting–skylights, clerestories
    - Solar orientation, earth berming and landscaping

89. The Project Sponsor shall demonstrate to the City Building Department that methods and materials, which minimize VOC emissions have been employed where practical, available and where value engineering allows it to be feasible.

96. Prior to issuance of a building permit, the Project Sponsor shall demonstrate to the City that the thermal integrity of new buildings is improved with automated time clocks or occupant sensors to reduce the thermal load.

97. Prior to issuance of a building permit, the Project Sponsor shall demonstrate to the City that window glazing, wall insulation, and efficient ventilation methods have been incorporated into building designs.

98. Prior to issuance of a building permit, the Project Sponsor shall demonstrate that building designs incorporate efficient heating units and other appliances, such as water heater, cooking equipment, refrigerators, furnaces and boiler units.

99. Prior to issuance of a building permit, the Project Sponsor shall incorporate into building designs, where feasible, passive solar designs and solar heaters.

105. The Project Sponsor shall ensure that all trucks used for hauling material shall be covered to minimize material loss during transit.

106. Project Sponsor shall ensure that all project related grading shall be performed in accordance with the City of Newport Beach Grading Ordinance, which contains procedures and requirements relative to dust control, erosion and siltation control, noise, and other grading related activities.

107. Prior to issuance of grading permits, the Project Sponsor shall demonstrate compliance with SCAQMD Rule 403 which will require watering during the morning and evening prior to or after earth moving operations. To further reduce dust generation, grading should not occur when wind speeds exceed 25 miles per hour (MPH), and soil binders or SCAQMD approved chemical stabilizers should be spread on construction sites or unpaved areas. Additional measures to control fugitive dust include street sweeping of roads used by construction vehicles, reduction of speeds on all unpaved roads to 15 miles per hour, suspension of operations during first and second stage smog alerts, and wheel washing before construction vehicles leave the site.

110. The Project Sponsor shall ensure that low emission mobile and stationary equipment is utilized during construction, and low sulfur fuel is utilized in stationary equipment, when available. Evidence of this fact shall be provided to the City of Newport Beach prior to issuance of any grading or building permit.

Measures 82, 89,105, 106, 107, and 110 are related to construction emissions. Note that measure 105 is covered by the California Vehicle Code that requires covering or adequate freeboard (i.e. the height of the side wall above the load) to minimize material loss. Measure 106 is compliance the City's Grading Ordinance, which is required of all grading activity in the City. Measure 107 is required for all grading in the South Coast Air Basin and the "to further reduce dust generation" items have been added to Rule 403 as standard conditions. Additional mitigation measures to reduce construction related emission are presented in Section 3.1. Because of the additional mitigation measures presented in Section 3.1, mitigation measures 105, 106, and 107 are no longer required while mitigation measures 82, 89, and 110 will continue to apply.

Measures, 37, 82, 96, 97, 98, and 99 are Energy Efficiency Measures and represent all feasible Energy Efficiency related air quality mitigation measures and will continue to apply.

Mitigation Measure 38 is a Transportation Demand Management (TDM) measure. In addition, the Hospital has additional TDM measures implemented to reduce vehicular trips. These measures include the promotion of ride sharing and carpooling through the implementation of dedicated carpool parking spaces, a formal vanpool program, ride matching services, and an account with yellow cab to provide guaranteed rides home due to illness, emergency, or unscheduled overtime. Bus schedules are available at cashiers, human resources and business services. The Hospital has on-site facilities that reduce trips including an ATM/Credit Union, cafeteria/lunch room, day care center, and transit pass sales. The hospital also provides compressed work weeks of 3/36 (12 hour shifts), 4/40 (10 hour shifts), and 9/80 (approximate 9 hour shifts) shifts for nursing and other departments and telecommuting for some employees. The hospital participates in emission/trip reduction strategies for compliance with SCAQMD Rule 2202 with an average vehicle ridership (AVR) goal of 1.5. If this AVR is not reached emission offsets are purchased by the hospital.

Two mitigation measures (Mitigation Measures 36 and 38) are proposed for revision. Mitigation Measure 36 requires verification of necessary permits from the SCAQMD for regulated equipment. It further states if the new emissions result in impacts not previously considered or significantly change the land use impact, appropriate CEQA documentation shall be prepared prior to issuance of any permits for that phase of development. This mitigation measure is combining two processes. The SCAQMD would review the data pertaining to the use of regulated equipment. In order for the applicant to receive the required permit, the project would need to meet the standards established by SCAQMD. The issue pertaining to new significant impacts associated with emissions or land use impacts would not be within SCAQMD's jurisdiction. The City of Newport Beach would continue to be responsible for ensuring that appropriate CEQA documentation is prepared. To avoid confusion, the portion of the mitigation measure related to CEQA documentation is recommended for deletion. The recommended changes are shown below. Strikeout text is used to show deleted wording and italic text is used to show wording that has been added. This measure, as modified, would continue to apply to the Hoag Hospital Master Plan.

36. Prior to the issuance of grading permits for each phase of development, the Project Sponsor shall provide evidence for verification by the Planning Department that the necessary permits have been obtained from the SCAQMD for regulated commercial equipment incorporated within each phase. An air quality analysis shall be conducted prior to each phase of development for the proposed mechanical equipment contained within that phase that identifies additional criteria pollutant emissions generated by the mechanical equipment to be installed in the phase. ~~If the new emissions, when added to existing project emissions could result in impacts not previously considered or significantly change the land use impact, appropriate CEQA documentation shall be prepared prior to issuance of any permits for that phase of development. Each subsequent air quality analysis shall be reviewed and approved by the SCAQMD.~~

For Mitigation Measure 38, a revision to item g is proposed to cross reference Mitigation Measure 30, which pertains to bus turnouts (Section XV, Transportation/Circulation). As discussed in Section XV, the location and design of bus turnouts is within jurisdiction of the Orange County Transportation Authority (OCTA).

38. Prior to the issuance of grading and building permits for each phase of Master Plan development, the Project Sponsor shall provide evidence that site plans incorporate the site development requirements of Ordinance No. 91-16, as appropriate, to the Traffic Engineering Division and Planning Department for review and Planning Commission approval. Requirements outlined in the Ordinance include:

    a. A minimum of five percent of the provided parking at new facilities shall be reserved for carpools. These parking spaces shall be located near the employee entrance or at other preferred locations.

    b. A minimum of two bicycle lockers per 100 employees shall be provided. Additional lockers shall be provided at such time as demands warrants.

    c. A minimum of one shower and two lockers shall be provided.

    d. Information of transportation alternatives shall be provided to all employees.

    e. A rideshare vehicle loading area shall be designated in the parking area.

    f. The design of all parking facilities shall incorporate provisions for access and parking of vanpool vehicles.

    g. Bus stop improvements shall be *coordinated with the Orange County Transportation Authority, consistent with the requirements of Mitigation Measure 30.* ~~required for developments located along arterials where public transit exists or is anticipated to exist within five years.~~

    The exact number of each of the above facilities within each phase of the Master Plan shall be determined by the City during review of grading and building permit applications for each phase. The types and numbers of facilities required of each phase will reflect the content of the Ordinance at the time that a permit application is deemed complete by the Planning Department.

The following mitigation measure was adopted as a part of Final EIR No. 142 and has been implemented. This mitigation measure would no longer need to be tracked through mitigation monitoring.

87. The Project Sponsor shall submit plans to the City Building Department verifying that all roadways associated with the development of the Master Plan will be paved early in the project, as a part of Phase I Master Plan development construction activities.

In addition, the Mitigation Measure 109 is proposed for deletion. When Final EIR No. 142 was certified in 1992, there was not a certified Air Quality Management Plan (AQMP). Therefore, a wide range of mitigation measures were identified in an effort to ensure the maximum amount of mitigation feasible. Since that time, the AQMP has been certified and the specific mitigation measures have been identified. Other mitigation measures (listed above) have been identified to address construction projects; however, stationary equipment is not a contributor to construction emissions.

109. Prior to issuance of a grading permit for each phase of construction the Project Sponsor shall submit an analysis to the City Building Department that documents the criteria emissions factors for all stationary equipment to be used during that phase of construction. The analysis shall utilize emission factors contained in the applicable SCAQMD Handbook. The analysis shall also be submitted to the City of Newport Beach Planning Department for review and approval

Mitigation Measure 121 is also proposed for deletion because the analysis shows that the Project is not projected to result in a CO hotspot at any intersections affected by the Project as discussed in Section 2.3.1. Further, the SCAB is technically in attainment of the CO ambient air quality standards and the AQMP contains an CO attainment demonstration that shows that CO concentrations do not exceed the ambient air quality standard even at the four worst intersections in the basin.

121. Prior to issuance of a grading permit for each individual phase of development, the Project Sponsor shall conduct, a CO hot spot analysis for the subject phase of development. This analysis shall utilize the EMFAC7EP emission factor program for the buildout year of the subject phase of development and the CALINE4 CO hot spot model or the model recommended for such analysis at that time. The results of this analysis shall be submitted to the City of Newport Beach Planning Department for review. City staff will verify consistency with the results of the project buildout CO analysis.

3.0 Mitigation Measures

3.1 Short-Term Impacts

3.1.1 Particulate Emission (PM-10) Control

During construction of the Project, the property owner/developer and its contractors are required to comply with regional rules, which will assist in reducing short-term air pollutant emissions. SCAQMD Rule 403 requires that fugitive dust be controlled with the best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Two options are presented in Rule 403; monitoring of particulate concentrations or active control. Monitoring involves a sampling network around the Project with no additional control measures unless specified concentrations are exceeded. The active control option does not require any monitoring, but requires that a list of measures be implemented starting with the first day of construction.

Rule 403 requires that "No person shall conduct active operations without utilizing the best available control measures included in Table 1 of this Rule to minimize fugitive dust emissions from each fugitive dust source type within the active operation." The measures from Table 1 of Rule 403 are presented below as Table 21. All applicable measures presented in Table 1 are required to be implemented by Rule 403. At this time, specific construction projects are not specified so it is unknown which measures will be applicable.

Rule 403 requires that "Large Projects" implement additional measures. A Large Project is defined as "any active operations on property which contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 3,850 cubic meters (5,000 cubic yards) for more than three times during the most recent 365 day period. Grading of the Project will not be considered a Large Project under Rule 403. Therefore, the Project will not be required to implement the applicable actions specified in Table 2 of the Rule. Table 2 from Rule 403 is presented below as Table 22.

Rule 403 also requires that the construction activities "shall not cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter when determined by simultaneous sampling, as the difference between upwind and down wind sample." Projects that cannot meet this performance standard are required to implement the applicable actions specified in Table 3 of Rule 403. Table 3 from Rule 403 is presented below as Table 23.

Further, Rule 403 requires that that the Project shall not "allow track-out to extend 25 feet or more in cumulative length from the point of origin from an active operation." All track-out from an active operation is required to be removed at the conclusion of each workday or evening shift. Any active operation with a disturbed surface area of five or more acres, or with a daily import or export of 100 cubic yards or more of bulk materials must utilize at least one of the measures listed in Table 24 at each vehicle egress from the site to a paved public road.

In order to minimize particulate emissions to the greatest extent feasible, the following mitigation measure requires that all listed control measures from Rule 403 to be implemented or reasons given to why the measures are not applicable or feasible

Mitigation Measure AQ-1: Implement all applicable feasible control measures from Table 1 (Table 21 below), Table 2 (Table 22 below), Table 3 (Table 23 below), and track out control measures (Table 24 below) of SCAQMD Rule 403. At this time, specific construction projects are not known so it is unknown which measures will be applicable or feasible. Prior to any construction related permit issuance (e.g.; demolition, grading or building permit), the applicant shall submit to the City a list of feasible measures that will be implemented and how they will be implemented along with a list of inapplicable or infeasible measures that will not be implemented for the specific construction project along with justification for the inapplicability or infeasibility finding.

Table 21
Required Best Available Control Measures (Rule 403 Table 1)

Source Category	Control Measure	Guidance
Backfilling		
01-1	Stabilize backfill material when not actively handling; and	• Mix backfill soil with water prior to moving
01-2	Stabilize backfill material during handling; and	• Dedicate water truck or high capacity hose to backfilling equipment
01-3	Stabilize soil at completion of activity.	• Empty loader bucket slowly so that no dust plumes are generated • Minimize drop height from loader bucket
Clearing and Grubbing		
02-1	Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and	• Maintain live perennial vegetation where possible • Apply water in sufficient quantity to prevent generation of dust plumes
02-2	Stabilize soil during clearing and grubbing activities; and	
02-3	Stabilize soil immediately after clearing and grubbing activities.	
Clearing Forms		
03-1	Use water spray to clear forms; or	• Use of high pressure air to clear forms may cause exceedance of Rule requirements
03-2	Use sweeping and water spray to clear forms; or	
03-3	Use vacuum system to clear forms.	
Crushing		
04-1	Stabilize surface soils prior to operation of support equipment; and	• Follow permit conditions for crushing equipment
04-2	Stabilize material after crushing.	• Pre-water material prior to loading into crusher • Monitor crusher emissions opacity • Apply water to crushed material to prevent dust plumes

Table 21 (Continued)
Required Best Available Control Measures (Rule 403 Table 1)

Source Category / Control Measure		Guidance
Cut and Fill		
05-1	Pre-water soils prior to cut and fill activities; and	• For large sites, pre-water with sprinklers or water trucks and allow time for penetration
05-2	Stabilize soil during and after cut and fill activities.	• Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts
Demolition – Mechanical/Manual		
06-1	Stabilize wind erodible surfaces to reduce dust; and	• Apply water in sufficient quantities to prevent the generation of visible dust plumes
06-2	Stabilize surface soil where support equipment and vehicles will operate; and	
06-3	Stabilize loose soil and demolition debris; and	
06-4	Comply with AQMD Rule 1403.	
Disturbed Soil		
07-1	Stabilize disturbed soil throughout the construction site; and	• Limit vehicular traffic and disturbances on soils where possible
07-02	Stabilize disturbed soil between structures	• If interior block walls are planned, install as early as possible • Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Earth-Moving Activities		
08-1	Pre-apply water to depth of proposed cuts; and	• Grade each project phase separately, timed to coincide with construction phase
08-2	Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and	• Upwind fencing can prevent material movement on site • Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
08-3	Stabilize soils once earth-moving activities are complete.	

Table 21 (Continued)
Required Best Available Control Measures (Rule 403 Table 1)

Source Category Control Measure	Guidance
Importing/Exporting of Bulk Materials	
09-1 Stabilize material while loading to reduce fugitive dust emissions; and 09-2 Maintain at least six inches of freeboard on haul vehicles; and 09-3 Stabilize material while transporting to reduce fugitive dust emissions; and 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with Vehicle Code Section 23114.	• Use tarps or other suitable enclosures on haul trucks • Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage • Comply with track-out prevention/mitigation requirements • Provide water while loading and unloading to reduce visible dust plumes
Landscaping	
10-1 Stabilize soils, materials, slopes	• Apply water to materials to stabilize Maintain materials in a crusted condition • Maintain effective cover over materials • Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes • Hydroseed prior to rain season
Road Shoulder Maintenance	
11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	• Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs • Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs
Screening	
12-1 Pre-water material prior to screening; and 12-2 Limit fugitive dust emissions to opacity and plume length standards; and 12-3 Stabilize material immediately after screening.	• Dedicate water truck or high capacity hose to screening operation • Drop material through the screen slowly and minimize drop height • Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point
Staging Areas	
13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	• Limit size of staging area • Limit vehicle speeds to 15 miles per hour • Limit number and size of staging area entrances/exists

Table 21 (Continued)
Required Best Available Control Measures (Rule 403 Table 1)

Source Category / Control Measure	Guidance
Stockpiles/ Bulk Material Handling	
14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	• Add or remove material from the downwind portion of the storage pile • Maintain storage piles to avoid steep sides or faces
Traffic Areas for Construction Activities	
15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	• Apply gravel/paving to all haul routes as soon as possible to all future roadway areas • Barriers can be used to ensure vehicles are only used on established parking areas/haul routes
Trenching	
16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16.2 Stabilize soils at the completion of trenching activities.	• Pre-watering of soils prior to trenching is an effective preventive measure. • For deep trenching activities, pre-trench to 18 inches soak soils via the pre-trench and resuming trenching • Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment
Truck Loading	
17-1 Pre-water material prior to loading; and 17.2 Ensure that freeboard exceeds six inches (CVC 23114)	• Empty loader bucket such that no visible dust plumes are created • Ensure that the loader bucket is close to the truck to minimize drop height while loading
Turf Overseeding	
18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	• Haul waste material immediately off-site

Table 21 (Continued)
Required Best Available Control Measures (Rule 403 Table 1)

Source Category / Control Measure		Guidance
Unpaved Roads/Parking Lots		
19-1	Stabilize soils to meet the applicable performance standards; and	• Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
19-2	Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	
Vacant Land		
20-1	In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	

Table 22
Dust Control Measures for Large Operations (Rule 403 Table 2)

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 ASTM method D2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-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 D2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an 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 California Air Resources Board and the U.S. 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 three hours of active operations during a calendar day, and two such evaluations during each subsequent four-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 five working days of grading completion; OR
(2d)	Take actions (3a) or (3c) specified for inactive disturbed surface areas.

Table 22 (Continued)
Dust Control Measures for Large Operations (Rule 403 Table 2)

Fugitive Dust Source Category	Control Actions
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 two hours of active operations [3 times per normal 8 hour work day]; OR
(4b)	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; 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. This option may only be used at aggregate-related plants or at cement manufacturing facilities.
All Categories	
(6a)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 2 may be used.

Table 23
Contingency Control Measures for Large Operations (Rule 403 Table 3)

Fugitive Dust Source Category / Control Actions
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 six months; OR
(1B) Apply chemical stabilizers prior to wind event; OR
(2B) Apply water to all unstabilized disturbed areas 3 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 2, 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 3 may be used.

Table 24
Track Out Control Options

(A)	Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 20 feet wide and 50 feet long.
(B)	Pave the surface extending at least 100 feet and a width of at least 20 feet wide.
(C)	Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipe, or grates) at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle under carriages before vehicles exit the site.
(D)	Install and utilize a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.
(E)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified items (A) through (D) above.

3.1.2 Construction Equipment Emission Control

While Measure AQ-1 above addresses particulate emissions from construction activities, other pollutants generated by construction equipment could contribute to exceedances of the SCAQMD thresholds. The generation of these emissions is almost entirely due to engine combustion in construction equipment and employee commuting. The measure below addresses these emissions.

Mitigation Measure AQ-2: The following measures shall be implemented to the greatest extent feasible to minimize vehicular emissions. At this time, specific construction projects are not known so it is unknown which measures will be feasible. Prior to any construction related permit issuance (e.g.; demolition, grading or building permit), the applicant shall submit to the City a list of feasible measures that will be implemented and how they will be implemented along with a list of inapplicable or infeasible measures that will not be implemented for the specific construction project along with justification for the inapplicability or infeasibility finding.

- Maintain construction equipment engines by keeping them tuned.
- Do not allow construction equipment to idle for more than five minutes. Shut off engines of equipment that will not be used for five or more minutes.
- Utilize alternative low emission fuels in construction equipment.
- Utilize diesel particulate filters on construction equipment.
- Utilize existing power sources (i.e., power poles) when available. This measure would minimize the use of higher polluting gas or diesel generators.
- Configure construction parking to minimize traffic interference.
- Minimize obstruction of through-traffic lanes. Construction should be planned so that lane closures on existing streets are kept to a minimum.
- Schedule construction operations affecting traffic for off-peak hours to the

best extent when possible.

- Develop a traffic plan to minimize traffic flow interference from construction activities (the plan may include advance public notice of routing, use of public transportation and satellite parking areas with a shuttle service.)

It should be noted that the California Air Resources Board (CARB) is currently working to establish new standards for new off-road construction vehicles and for existing in-use off-road construction vehicles. The current proposal for existing vehicles is to establish total fleet emission requirements for individual contractors which can be met through equipment turnover or retrofitting old equipment. All contractors in the State of California will be required to comply with any requirements adopted by CARB.

The following mitigation measure will minimize VOC emissions to the greatest extent possible. VOC emissions are primarily due to the application of architectural coatings (painting).

Mitigation Measure AQ-03: The following measures shall be implemented to the greatest extent feasible to minimize VOC emissions during application of architectural coatings. At this time, specific construction projects are not known so it is unknown which measures will be feasible. Prior to any building permit issuance, the applicant shall submit to the City a list of feasible measures that will be implemented and how they will be implemented along with a list of inapplicable or infeasible measures that will not be implemented for the specific construction project along with justification for the inapplicability or infeasibility finding.

- Minimize the amount of paint used by using pre-coated, pre-colored and naturally colored building materials; and
- Use high transfer efficiency painting methods such as HVLP (High Volume Low Pressure) sprayers and brushes/rollers were possible.

3.2 Long-Term Impacts

3.2.1 Local Air Quality Impacts

The future carbon monoxide (CO) emissions are projected to be in compliance with the 1-hour and 8-hour State and Federal standards, and therefore, the local air quality impacts due to the Project are not considered to be significant. Therefore, the Project will not result in a significant local air quality impacts.

3.2.2 Regional Emissions

The analysis presented in Section 2.3.2 showed that the implementation of the Project or Project Alternative would result in reductions in operational emissions compared to emissions that would occur with the currently approved Master Plan. However, increases in CO, VOC, and NO_x emissions associated with the development of the Master Plan as modified by the Project and the Project Alternative were shown to exceed the SCAQMD threshold of significance. Exceedance of the SCAQMD thresholds is attributable primarily to vehicular traffic. Mitigation measures for regional air quality impacts are generally separated into two categories, Transportation Demand Measures to minimize emissions from vehicular activity, and Energy Efficiency Measures to minimize emissions due to generation of electricity, water heating, and space heating and cooling. Mitigation measures from Final EIR No. 142 prepared for the approved Master Plan are presented in Section 2.5. Measures, 37, 88, 96, 97, 98, and 99 are Energy Efficiency Measures and represent all feasible Energy Efficiency related air quality mitigation measures. In addition, all new construction at the Hospital is required to comply with Title 24, Part 5 of California's Energy Efficiency Standards for Nonresidential buildings.

Mitigation Measure 38 from the Master Plan EIR is a Transportation Demand Management Measure. In addition, the Hospital has additional measures implemented to reduce vehicular trips discussed in Section 2.5.

All feasible Energy Efficiency Measures are required as mitigation from the previously adopted EIR for the Hospital Master Plan. Further, the hospital has implemented all feasible Transportation Demand Management Measures. The California Air Resources Board (CARB) is responsible for establishing vehicular emission regulations which are set per state and federal regulations and any future reductions will be implemented by CARB outside the context of this project. Therefore, no additional mitigation is required.

4.0 Unavoidable Significant Impacts

4.1 Short-Term Impacts

The analysis indicates that Project emissions of PM_{10}, $PM_{2.5}$, NO_x and VOC from construction activities will likely exceed the SCAQMD's Thresholds of Significance. Mitigation will reduce emissions, but possibly not to the point that they will fall under the SCAQMD's thresholds. Therefore, construction emissions may exceed the SCAQMD thresholds even after mitigation, and short-term construction air quality impacts would, in that event, be significant, including potential human health implications associated with each of the two pollutants (see discussion of effects of pollutants on health in Section 1.3).

4.2 Long-Term Impacts

At the time Final EIR No. 142 for the Master Plan was prepared, SCAQMD had not published the significance thresholds used to determine that the Project would have a significant impact. In Final EIR No. 142, the development of the Master Plan was found to not have a significant regional air quality impact by itself. Cumulative air quality impacts were found to be significant and unavoidable. The finding of no significant impact for the Project was reached by comparing the Project emissions with regional emissions for the South Coast Air Basin and Source Receptor Area 18. The analysis concluded that since the Project represented such a small portion of regional emissions that it did not result in a significant impact. However, CO VOC and NO_x emissions projected in Final EIR No. 142 were greater than the SCAQMD significance thresholds established in the 1993 SCAQMD CEQA Air Quality Handbook. The Project or Project Alternative would generate fewer pollutant emissions than would occur with the Master Plan due to trip reductions associated with the proposed Project and Project Alternative. Thus development of the Project or Project Alternative will not have a significant impact in comparison to the No Project option (completion of the Master Plan as already approved).

The analysis indicates that operational emissions from either the Project or Project Alternative will exceed the SCAQMD's Thresholds of Significance for CO, VOC, and NO_x. Mitigation will reduce emissions, but not to the point that they will fall under the SCAQMD's thresholds. Therefore, operational emissions of CO, VOC, and NO_X will exceed the SCAQMD thresholds even after mitigation, and long-term regional air quality impacts will be significant, including potential human health implications associated with each of the subject pollutants (see discussion of effects of pollutants on health in Section 1.3).

APPENDIX

Operational Emissions Calculation Worksheets

• MESTRE GREVE ASSOCIATES PROJECT EMISSIONS WORKSHEET •

v. 04.07

Project: *Hoag Hospital Master Plan Existing Uses*
Study Year: *2007*
County: *OC*

1. VEHICULAR EMISSIONS

Emission Factor Source: EMFAC200 7Worst-Case By SCAQMD

General Vehicles				Heavy Duty Diesel Trucks	
Number of Trips=	13,988	% Pass. Veh. =	95.0%	Number of Trips=	0
Avg. Trip Length =	9.0	% Deliv. Trucks =	5.0%	Avg. Trip Length =	9.0
VMT =	125,892			VMT =	0

	CO	VOC	NOx	PM10	PM2.5	SOx
Factors (lb/mi)						
Passenger Vehicle	0.011552	0.001182	0.001213	0.000084	0.000052	0.000011
Delivery Trucks	0.024076	0.003231	0.025084	0.000910	0.000789	0.000026
Heavy Duty Diesel Trucks	0.014462	0.003729	0.047182	0.002309	0.002040	0.000040
Emissions (Lb/Dy)	1,533.1	161.7	303.0	15.8	11.2	1.5

2. ON SITE EMISSIONS DUE TO NATURAL GAS COMBUSTION

Source: SCAQMD CEQA Handbook

Unit Type	Gas ft³/DU/Mo.	DU	Gas ft³/day	
Single Fam.	6665	0	0	
Mult. Fam. <=4	4105	0	0	
Mult. Fam. >=5	3918	0	0	
	ft³/ft²/Mo.	ft²	*0*	*Subtotal for Residential*
Hospital	2	0	0	
Office/Retail	2.9	0	0	
Hotel/Motel	4.8	886,270	139,479	
	ft³/Customer/Mo.	Customers/Mo.	*139,479*	*Subtotal for Retail/Commercial*
Industrial	2936.6	0	0	
			0	*Subtotal for Industrial*
			139,479	**Total Gas Usage/Day**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/10^6 ft³)	20.0	5.3	0.7	0.2	0.2	0.0
Emissions (Lb/Dy)	2.8	0.7	16.7	0.0	0.0	0.0

3. ON SITE EMISSIONS DUE TO CONSUMER PRODUCT USAGE

Emission Factor Source: URBEMIS2002

Number of Residents: **0**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/resident)	0.0000	0.0171	0.0000	0.0000	0.0000	0.0000
Emissions (Lb/Dy)	0.0	0.0	0.0	0.0	0.0	0.0

4. ON-SITE EMISSIONS DUE TO ELECTRICAL GENERATION

Number of Cogneration Generators **3** — 1,475 kw/unit * 24 unit hr/day = 106,200 KWH

	CO	ROG	NOx	PM10	PM2.5	SOx
Factor (lbs/day/unit)	24.41	16.51	16.51	4.95	4.90	0.00
Emissions (Lb/Dy)	73.2	49.5	49.5	14.9	14.7	0.0

**TOTAL PROJECT EMISSIONS **

	CO	VOC	NOx	PM10	PM2.5	SOx
lbs/day	1,609.1	212.0	369.3	30.7	26.0	1.5
Ton/day	0.80	0.11	0.18	0.02	0.01	0.00
2020 SCAB (Tons/Day)	1,920	544	504	315	--	73
Percent Regional	0.042%	0.019%	0.037%	0.005%	--	0.001%

• MESTRE GREVE ASSOCIATES PROJECT EMISSIONS WORKSHEET •

v. 04.07

Project: *Hoag Hospital Master Plan Existing Uses*
Study Year: *2015*
County: *OC*

1. VEHICULAR EMISSIONS

Emission Factor Source: EMFAC200 7Worst-Case By SCAQMD

General Vehicles				Heavy Duty Diesel Trucks	
Number of Trips=	13,988	% Pass. Veh. =	95.0%	Number of Trips=	0
Avg. Trip Length =	9.0	% Deliv. Trucks =	5.0%	Avg. Trip Length =	9.0
VMT =	125,892			VMT =	0

	CO	VOC	NOx	PM10	PM2.5	SOx
Factors (lb/mi)						
Passenger Vehicle	0.006141	0.000664	0.000602	0.000093	0.000060	0.000011
Delivery Trucks	0.011694	0.001739	0.012850	0.000503	0.000413	0.000027
Heavy Duty Diesel Trucks	0.007669	0.001786	0.021227	0.001047	0.000880	0.000041
Emissions (Lb/Dy)	808.1	90.3	152.9	14.2	9.8	1.5

2. ON SITE EMISSIONS DUE TO NATURAL GAS COMBUSTION

Source: SCAQMD CEQA Handbook

Unit Type	Gas ft³/DU/Mo.	DU	Gas ft³/day	
Single Fam.	6665	0	0	
Mult. Fam. <=4	4105	0	0	
Mult. Fam. >=5	3918	0	0	
	ft³/ft²/Mo.	ft²	*0*	*Subtotal for Residential*
Hospital	2	0	0	
Office/Retail	2.9	0	0	
Hotel/Motel	4.8	886,270	139,479	
	ft³/Customer/Mo.	Customers/Mo.	*139,479*	*Subtotal for Retail/Commercial*
Industrial	2936.6	0	0	
			0	*Subtotal for Industrial*
			139,479	**Total Gas Usage/Day**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/10^6 ft³)	20.0	5.3	0.7	0.2	0.2	0.0
Emissions (Lb/Dy)	2.8	0.7	16.7	0.0	0.0	0.0

3. ON SITE EMISSIONS DUE TO CONSUMER PRODUCT USAGE

Emission Factor Source: URBEMIS2002

Number of Residents: 0

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/resident)	0.0000	0.0171	0.0000	0.0000	0.0000	0.0000
Emissions (Lb/Dy)	0.0	0.0	0.0	0.0	0.0	0.0

4. ON-SITE EMISSIONS DUE TO ELECTRICAL GENERATION

Number of Cogneration Generators 3 — 1,475 kw/unit * 24 unit hr/day = 106,200 KWH

	CO	ROG	NOx	PM10	PM2.5	SOx
Factor (lbs/day/unit)	24.41	16.51	16.51	4.95	4.90	0.00
Emissions (Lb/Dy)	73.2	49.5	49.5	14.9	14.7	0.0

**TOTAL PROJECT EMISSIONS **

	CO	VOC	NOx	PM10	PM2.5	SOx
lbs/day	884.1	140.6	219.1	29.1	24.5	1.5
Ton/day	0.44	0.07	0.11	0.01	0.01	0.00
2020 SCAB (Tons/Day)	1,920	544	504	315	--	73
Percent Regional	0.023%	0.013%	0.022%	0.005%	--	0.001%

• MESTRE GREVE ASSOCIATES PROJECT EMISSIONS WORKSHEET •

v. 04.07

Project: ***Hoag Hospital Master Plan Future Development w/o Project***
Study Year: ***2015***
County: ***OC***

1. VEHICULAR EMISSIONS

Emission Factor Source: EMFAC200 7Worst-Case By SCAQMD

General Vehicles				*Heavy Duty Diesel Trucks*	
Number of Trips=	*27,152*	% Pass. Veh. = *95.0%*		Number of Trips=	*0*
Avg. Trip Length =	*9.0*	% Deliv. Trucks = *5.0%*		Avg. Trip Length =	*9.0*
VMT =	*244,368*			VMT =	*0*

	CO	VOC	NOx	PM10	PM2.5	SOx
Factors (lb/mi)						
Passenger Vehicle	0.006141	0.000664	0.000602	0.000093	0.000060	0.000011
Delivery Trucks	0.011694	0.001739	0.012850	0.000503	0.000413	0.000027
Heavy Duty Diesel Trucks	0.007669	0.001786	0.021227	0.001047	0.000880	0.000041
Emissions (Lb/Dy)	1,568.5	175.3	296.7	27.6	19.0	2.8

2. ON SITE EMISSIONS DUE TO NATURAL GAS COMBUSTION

Source: SCAQMD CEQA Handbook

Unit Type	Gas ft³/DU/Mo.	DU	Gas ft³/day	
Single Fam.	6665	*0*	0	
Mult. Fam. <=4	4105	*0*	0	
Mult. Fam. >=5	3918	*0*	0	
	ft³/ft²/Mo.	ft²	*0*	*Subtotal for Residential*
Hospital	2	*0*	0	
Office/Retail	2.9	*0*	0	
Hotel/Motel	4.8	*1,343,238*	211,395	
	ft³/Customer/Mo.	Customers/Mo.	*211,395*	*Subtotal for Retail/Commercial*
Industrial	2936.6	*0*	0	
			0	*Subtotal for Industrial*
			211,395	**Total Gas Usage/Day**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/10^6 ft³)	20.0	5.3	0.7	0.2	0.2	0.0
Emissions (Lb/Dy)	4.2	1.1	25.4	0.0	0.0	0.0

3. ON SITE EMISSIONS DUE TO CONSUMER PRODUCT USAGE

Emission Factor Source: URBEMIS2002

Number of Residents: **0**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/resident)	0.0000	0.0171	0.0000	0.0000	0.0000	0.0000
Emissions (Lb/Dy)	0.0	0.0	0.0	0.0	0.0	0.0

4. ON-SITE EMISSIONS DUE TO ELECTRICAL GENERATION

Number of Cogneration Generators **6** — 1,475 kw/unit * 24 unit hr/day = 212,400 KWH

	CO	ROG	NOx	PM10	PM2.5	SOx
Factor (lbs/day/unit)	24.41	16.51	16.51	4.95	4.90	0.00
Emissions (Lb/Dy)	146.5	99.1	99.1	29.7	29.4	0.0

***TOTAL PROJECT EMISSIONS ***

	CO	VOC	NOx	PM10	PM2.5	SOx
lbs/day	1,719.2	275.5	421.2	57.4	48.5	2.8
Ton/day	0.86	0.14	0.21	0.03	0.02	0.00
2020 SCAB (Tons/Day)	1,920	544	504	315	--	73
Percent Regional	0.045%	0.025%	0.042%	0.009%	--	0.002%

• MESTRE GREVE ASSOCIATES PROJECT EMISSIONS WORKSHEET •

v. 04.07

Project: *Hoag Hospital Master Plan Future Development w Project*
Study Year: *2015*
County: *OC*

1. VEHICULAR EMISSIONS

Emission Factor Source: EMFAC200 7Worst-Case By SCAQMD

General Vehicles				Heavy Duty Diesel Trucks	
Number of Trips=	*22,801*	% Pass. Veh. =	*95.0%*	Number of Trips=	*0*
Avg. Trip Length =	*9.0*	% Deliv. Trucks =	*5.0%*	Avg. Trip Length =	*9.0*
VMT =	*205,209*			VMT =	*0*

	CO	VOC	NOx	PM10	PM2.5	SOx
Factors (lb/mi)						
Passenger Vehicle	0.006141	0.000664	0.000602	0.000093	0.000060	0.000011
Delivery Trucks	0.011694	0.001739	0.012850	0.000503	0.000413	0.000027
Heavy Duty Diesel Trucks	0.007669	0.001786	0.021227	0.001047	0.000880	0.000041
Emissions (Lb/Dy)	1,317.2	147.2	249.2	23.2	16.0	2.4

2. ON SITE EMISSIONS DUE TO NATURAL GAS COMBUSTION

Source: SCAQMD CEQA Handbook

Unit Type	Gas ft³/DU/Mo.	DU	Gas ft³/day	
Single Fam.	6665	*0*	0	
Mult. Fam. <=4	4105	*0*	0	
Mult. Fam. >=5	3918	*0*	0	
	ft³/ft²/Mo.	ft²	*0*	*Subtotal for Residential*
Hospital	2	*0*	0	
Office/Retail	2.9	*0*	0	
Hotel/Motel	4.8	*1,343,238*	211,395	
	ft³/Customer/Mo.	Customers/Mo.	*211,395*	*Subtotal for Retail/Commercial*
Industrial	2936.6	*0*	0	
			0	*Subtotal for Industrial*
			211,395	**Total Gas Usage/Day**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/10^6 ft³)	20.0	5.3	0.7	0.2	0.2	0.0
Emissions (Lb/Dy)	4.2	1.1	25.4	0.0	0.0	0.0

3. ON SITE EMISSIONS DUE TO CONSUMER PRODUCT USAGE

Emission Factor Source: URBEMIS2002

Number of Residents: **0**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/resident)	0.0000	0.0171	0.0000	0.0000	0.0000	0.0000
Emissions (Lb/Dy)	0.0	0.0	0.0	0.0	0.0	0.0

4. ON-SITE EMISSIONS DUE TO ELECTRICAL GENERATION

Number of Cogneration Generators **6** — 1,475 kw/unit * 24 unit hr/day = 212,400 KWH

	CO	ROG	NOx	PM10	PM2.5	SOx
Factor (lbs/day/unit)	24.41	16.51	16.51	4.95	4.90	0.00
Emissions (Lb/Dy)	146.5	99.1	99.1	29.7	29.4	0.0

**TOTAL PROJECT EMISSIONS **

	CO	VOC	NOx	PM10	PM2.5	SOx
lbs/day	1,467.9	247.4	373.6	53.0	45.4	2.4
Ton/day	0.73	0.12	0.19	0.03	0.02	0.00
2020 SCAB (Tons/Day)	1,920	544	504	315	--	73
Percent Regional	0.038%	0.023%	0.037%	0.008%	--	0.002%

• MESTRE GREVE ASSOCIATES PROJECT EMISSIONS WORKSHEET •

v. 04.07

Project: *Hoag Hospital Master Plan Future Development w Project Alternative*
Study Year: *2015*
County: *OC*

1. VEHICULAR EMISSIONS

Emission Factor Source: EMFAC200 7Worst-Case By SCAQMD

General Vehicles				Heavy Duty Diesel Trucks	
Number of Trips=	*25,365*	% Pass. Veh. =	*95.0%*	Number of Trips=	*0*
Avg. Trip Length =	*9.0*	% Deliv. Trucks =	*5.0%*	Avg. Trip Length =	*9.0*
VMT =	*228,285*			VMT =	*0*

	CO	VOC	NOx	PM10	PM2.5	SOx
Factors (lb/mi)						
Passenger Vehicle	0.006141	0.000664	0.000602	0.000093	0.000060	0.000011
Delivery Trucks	0.011694	0.001739	0.012850	0.000503	0.000413	0.000027
Heavy Duty Diesel Trucks	0.007669	0.001786	0.021227	0.001047	0.000880	0.000041
Emissions (Lb/Dy)	1,465.3	163.8	277.2	25.8	17.8	2.6

2. ON SITE EMISSIONS DUE TO NATURAL GAS COMBUSTION

Source: SCAQMD CEQA Handbook

Unit Type	Gas ft³/DU/Mo.	DU	Gas ft³/day	
Single Fam.	6665	*0*	0	
Mult. Fam. <=4	4105	*0*	0	
Mult. Fam. >=5	3918	*0*	0	
	ft³/ft²/Mo.	ft²	*0*	*Subtotal for Residential*
Hospital	2	*0*	0	
Office/Retail	2.9	*0*	0	
Hotel/Motel	4.8	*1,343,238*	211,395	
	ft³/Customer/Mo.	Customers/Mo.	*211,395*	*Subtotal for Retail/Commercial*
Industrial	2936.6	*0*	0	
			0	*Subtotal for Industrial*
			211,395	**Total Gas Usage/Day**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/10^6 ft³)	20.0	5.3	0.7	0.2	0.2	0.0
Emissions (Lb/Dy)	4.2	1.1	25.4	0.0	0.0	0.0

3. ON SITE EMISSIONS DUE TO CONSUMER PRODUCT USAGE

Emission Factor Source: URBEMIS2002

Number of Residents: **0**

	CO	VOC	NOx	PM10	PM2.5	SOx
Factor (lbs/resident)	0.0000	0.0171	0.0000	0.0000	0.0000	0.0000
Emissions (Lb/Dy)	0.0	0.0	0.0	0.0	0.0	0.0

4. ON-SITE EMISSIONS DUE TO ELECTRICAL GENERATION

Number of Cogneration Generators **6** — 1,475 kw/unit * 24 unit hr/day = 212,400 KWH

	CO	ROG	NOx	PM10	PM2.5	SOx
Factor (lbs/day/unit)	24.41	16.51	16.51	4.95	4.90	0.00
Emissions (Lb/Dy)	146.5	99.1	99.1	29.7	29.4	0.0

***TOTAL PROJECT EMISSIONS ***

	CO	VOC	NOx	PM10	PM2.5	SOx
lbs/day	1,616.0	263.9	401.6	55.6	47.2	2.6
Ton/day	0.81	0.13	0.20	0.03	0.02	0.00
2020 SCAB (Tons/Day)	1,920	544	504	315	--	73
Percent Regional	0.042%	0.024%	0.040%	0.009%	--	0.002%