SECTION 4.2

Air Quality

4.2 AIR QUALITY

4.2.1 Existing Conditions

Meteorological Setting

The project site is located on the coastal plain in the City of Goleta (City). The climate in and around the City of Goleta, as well as most of Southern California, is dominated by the strength and position of the semi-permanent high-pressure center over the Pacific Ocean near Hawaii. It creates cool summers, mild winters, and infrequent rainfall. It drives the cool daytime sea breeze, and it maintains a comfortable humidity range and ample sunshine after the frequent morning clouds dissipate. However, the same atmospheric processes that create the desirable living climate combine to restrict the ability of the atmosphere to disperse the air pollution generated by the population attracted in part by the desirable climate.

Temperatures in the Goleta area average 59 degrees annually. Daily and seasonal oscillations of mean temperature are small because of the moderating effects of the nearby oceanic thermal reservoir. In contrast to the steady temperature regime, rainfall is highly variable. Measurable precipitation occurs mainly from early November to mid-April, but total amounts are generally small. Goleta averages 18 inches of rain annually with January as the wettest month.

Winds in the project vicinity display several characteristic regimes. During the day, especially in summer, winds are from the south in the morning, and from the west in the afternoon. Daytime wind speeds are 5-10 miles per hour on average. At night, especially in winter, the land becomes cooler than the ocean, and an offshore wind of 3-5 miles per hour develops. Early morning winds are briefly from the southeast parallel to the coastline before the daytime onshore flow becomes well established again. One other important wind regime occurs when a high pressure occurs over the western United States that creates hot, dry, and gusty Santa Ana winds from the north and northeast across Santa Barbara County.

The net effect of the wind pattern on air pollution is that locally generated emissions are carried offshore at night, and toward inland Santa Barbara County by day. Dispersion of pollutants is restricted when the wind velocity for nighttime breezes is low. The lack of development in inland Santa Barbara County, however, causes few air quality problems during nocturnal air stagnation. Daytime ventilation is usually much more vigorous. Both summer and winter air quality in the project area is generally very good.

In addition to winds that control the rate and direction of pollution dispersal, Southern California experiences strong temperature inversions that limit the vertical depth through which pollution can be mixed. In summer, coastal areas are characterized by a sharp discontinuity between the cool marine air at the surface and the warm, sinking air aloft within the high-pressure cell over the ocean to the west. This marine/subsidence inversion allows for good local mixing, but acts like a giant lid over the basin. Air starting onshore at the beach is relatively clean, but becomes progressively more polluted as sources continue to add pollution from below without any dilution from above. Because of Goleta's location relative to the ocean, the incoming marine air during warm season onshore flow contains little air pollution. Local air quality is not substantially affected by the regional subsidence inversions.

A second inversion type forms on clear, winter nights when cold air off the mountains sinks to the surface while the air aloft remains warm. This process forms radiation inversions. These inversions, in conjunction with calm winds, trap pollutants such as automobile exhaust near their

source. During the long nocturnal drainage flow from land to sea, the exhaust pollutants continually accumulate within the shallow, cool layer of air near the ground. Therefore, most areas of Santa Barbara County may experience stagnation of carbon monoxide and nitrogen oxides because of this winter radiation inversion condition. However, Santa Barbara County does not have enough mobile sources (which continue to become cleaner each year) such that limited nocturnal mixing effects have not created any localized air pollution "hot spots" at any air monitoring location in over 15 years.

Both types of inversions occur throughout the year to some extent, but the marine inversions are very dominant during the day in summer, and radiation inversions are much stronger on winter nights when nights are long and air is cool. The governing role of these inversions in atmospheric dispersion leads to a substantially different air quality environment in summer than in winter.

Existing Air Quality

The project is located in the South Central Coast Air Basin (SCCAB). The SCCAB encompasses San Luis Obispo, Santa Barbara, and Ventura Counties. The project site is located in Santa Barbara County. The California Air Resources Board (ARB) and the Santa Barbara County Air Pollution Control District (APCD) operate ambient air monitoring stations that measure pollutant concentrations throughout Santa Barbara County and the SCCAB. The nearest monitoring stations to the project site are: the Goleta monitoring station, located at 380 North Fairview Avenue, which monitors ozone (O_3), carbon monoxide (CO) and nitrogen oxides (NO_x); and the Santa Barbara station, located at 700 East Canon Perdido, which measures inhalable particulate matter (PM-10), and fine particulate matter (PM-2.5). **Table 4.2-1** summarizes the last seven ~~five~~ years of published data from these monitoring stations. The following conclusions can be drawn from these data:

1. Photochemical smog (ozone) levels infrequently exceed standards. The State ~~standard for~~ 1-hour ozone standard has not been exceeded ~~once~~ in seven ~~five~~ years, and the State and Federal 8-hour standards were each exceeded once in 2009.
2. CO measurements in Goleta have declined since 2004. Federal and State CO standards have not been exceeded in the last seven ~~five~~ years. Maximum one- or 8-hour CO levels at the closest air monitoring station are currently less than 25 percent of their most stringent standards because of continued vehicular improvements. This data suggests that baseline CO levels in the project area are generally healthful and can accommodate a reasonable level of additional traffic emissions before any adverse local air quality effects would be expected.
3. PM-10 levels occasionally exceed the State standard, but the Federal particulate standard is very rarely exceeded. The State PM-10 standard is exceeded on less than 6 percent of all days while the more lenient, Federal standard has only been exceeded once in the past 6 ~~4~~ years.
4. A substantial fraction of PM-10 is comprised of ultra-small diameter particulates capable of being inhaled into deep lung tissue (PM-2.5). Even with the revision of the national 24-hour PM-2.5 standard from 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$, the frequency of days exceeding the standard is minimal. PM-2.5 measurements have only exceeded Federal standards once since 2004.
5. More localized pollutants such as NOx, lead, etc. are likely very low near the project site because background levels never exceed allowable levels based on APCD's monitoring

of measured pollutants according to federal standards. There is substantial excess dispersive capacity to accommodate localized vehicular air pollutants such as NOx without any threat of violating the applicable standards.

Table 4.2-1
Project Area Air Quality Monitoring Summary (2004 - ~~2008~~2010)
(Days Standards Were Exceeded and Maximum Observed Levels)

Pollutant/Standard	2004	2005	2006	2007	2008	2009	2010
Ozone[1]							
1-Hour > 0.09 ppm (S)	0	0	0	0	0	0	0
8-Hour > 0.07 ppm (S)	2	0	0	0	0	1	0
8- Hour > 0.08 ppm (F)	1	0	0	0	0	1	
Max. 1-Hour Conc. (ppm)	0.092	0.080	0.083	0.081	0.081	0.09	0.072
Max. 8-Hour Conc. (ppm)	0.088	0.066	0.069	0.066	0.066	0.078	0.065
Carbon Monoxide[1]							
1-Hour > 20. ppm (S)	0	0	0	0	0	0	0
1-Hour > 9. ppm (S, F)	0	0	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	2.0	1.8	1.1	2.2	1.4	1.6	xx
Max. 8-Hour Conc. (ppm)	0.9	0.8	0.8	1.1	0.6	0.6	0.6
Nitrogen Dioxide[1]							
1-Hour > 0.18 ppm (S)	0	0	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.043	0.044	0.039	0.046	0.053	0.046	0.044
Inhalable Particulates (PM-10)[2,3]							
24-Hour > 50 $\mu g/m^3$ (S)	-	1/346	12/346	25/353	44/347	8/351	3/xx
24-Hour > 150 $\mu g/m^3$ (F)	-	0/346	0/346	1/353	0/347	0/351	0/xx
Max. 24-Hr. Conc. ($\mu g/m^3$)	-	59.0	108.0	400*	109.0	126	58
Ultra-Fine Particulates (PM-2.5)[2,3]							
24-Hour > 35 $\mu g/m^3$ (F)	0/55	0/52	0/55	0/60	1/59	0/50	0/xx
Max. 24-Hr. Conc. ($\mu g/m^3$)	27.5	28.3	27.9	23.5	44.2	25.3	12.1

*wildfire event, not counted as part of regular statistics
S = State standard
F = Federal standard
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
xx = data not reported on CARB website
Source: South Central Coast – [1]Goleta, [2]Santa Barbara Air Monitoring Station Data Summaries.
[3] Fractions = (days violations recorded) / (days monitored)

Regulatory Framework

Ambient Air Quality Standards (AAQS)

Federal and State ambient air quality standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research has shown, however, that

chronic exposure to ozone (the primary ingredient in photochemical smog) may lead to adverse respiratory health even at concentrations close to the ambient standard.

National AAQS were established in 1971 for six pollution constituents with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended several times in air quality problem areas like Southern California. Because California had established AAQS several years before the Federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between State and Federal clean air standards. Those standards currently in effect in California are shown in **Table 4.2-2**. Sources and health effects of criteria air pollutants are summarized in **Table 4.2-3**.

The Federal Clean Air Act Amendments (CAAA) of 1990 required that the U.S. Environmental Protection Agency (EPA) review all national AAQS in light of currently known health effects. EPA was charged with modifying existing standards or promulgating new ones where appropriate. EPA subsequently developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "PM-2.5"). New national AAQS were adopted in 1997 for these pollutants.

Evaluation of the most current data on the health effects of inhalation of fine particulate matter prompted the California Air Resources Board (CARB) to recommend adoption of the State PM-2.5 standard that is more stringent than the Federal standard. This standard was adopted in 2002. The State PM-2.5 standard is more of a goal in that it does not have specific attainment planning requirements like a Federal clean air standard, but only requires continued progress towards attainment.

Similarly, the CARB extensively evaluated health effects of ozone exposure. A new State standard for an 8-hour ozone exposure was adopted in 2005, which aligned with the Federal 8-hour standard. The California 8-hour ozone standard of 0.07 ppm is more stringent than the Federal 8-hour standard of 0.075 ppm. The State standard, however, does not have a specific attainment deadline. California air quality jurisdictions are required to make steady progress towards attaining state standards, but there are no hard deadlines or any consequences of non-attainment. During the same re-evaluation process, the CARB adopted an annual State standard for nitrogen dioxide (NO_2), that is more stringent than the corresponding Federal standard, and strengthened the state one-hour NO_2 standard.

As part of EPA's 2002 consent decree on clean air standards, a further review of airborne particulate matter (PM) and human health was initiated. A substantial modification of Federal clean air standards for PM was promulgated in 2006. Standards for PM-2.5 were strengthened, a new class of PM in the 2.5 to 10 micron size was created, some PM-10 standards were revoked, and a distinction between rural and urban air quality was adopted.

In response to continuing evidence that ozone exposure at levels just meeting Federal clean air standards is demonstrably unhealthful, EPA has proposed a further strengthening of the 8-hour standard.

Table 4.2-2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		-		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetic Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–	–	–
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.03 ppm (57 µg/m^3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemilumi-nescence
	1 Hour	0.18 ppm (339 µg/m^3)		–		
Lead	30-Day average	1.5 µg/m^3	Atomic Absorption	–	–	–
	Calendar Quarter	–		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-month Average	-		0.15 µg/m^3		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	–	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	–	
	3 Hour	–		–	0.5 ppm (1,300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		–	–	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer–visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hour	0.01ppm (26 µg/m^3)	Gas Chromatography			

Table 4.2-3
Source and Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Fine Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources. • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source:California Air Resources Board, 2002.

A new Federal one-hour standard for NO_2 has also recently been adopted. This standard is more stringent than the existing State standard. Based upon air quality monitoring data in the SCCAB, the basin will likely be designated as "non-attainment" for the national one-hour standard. That designation will require the inclusion of NO_2 in the basin air quality management plan.

Air Quality Planning

State and Federal laws require that jurisdictions, which do not meet clean air standards, develop plans and programs that will bring those areas into compliance. These plans typically contain emission reduction measures and attainment schedules to meet specified deadlines. If and when attainment is reached, the attainment plan becomes a "maintenance plan."

In 2001, an attainment plan was developed that was designed to meet both Federal and State planning requirements. The Federal attainment plan was combined with those from other statewide non-attainment areas to become the State Implementation Plan (SIP). The 2001 Clean Air Plan (CAP) was adopted as the Santa Barbara County portion of the SIP, designed to meet and maintain Federal clean air standards. The 2010 CAP, adopted by the APCD Board, incorporates updated data and is currently the most recent Clean Air Plan for ultimately meeting the state ozone standard.

As of 2008, Santa Barbara County is designated as a Federal ozone attainment area for the 8-hour ozone standard (the 1-hour Federal standard was revoked for Santa Barbara County). A new California 8-hour ozone standard was implemented in May 2006. Air quality conditions in the County currently exceed the State 8-hour ozone and PM10 standards. Santa Barbara County is therefore a non-attainment area for the State standards for ozone and for PM-10. The County is in attainment for the Federal PM2.5 standard and unclassified for the State PM2.5 standard (based on monitored data from 2006 – 2008), and is designated "attainment" or "unclassified" for other State standards and for all Federal clean air standards.

Thresholds of Significance

According the City of Goleta's *Environmental Thresholds and Guidelines Manual*, a significant adverse air quality impact may occur when a project individually or cumulatively:

a. Interferes with progress towards the attainment of the ozone standard by releasing emissions that equal or exceed 25 pounds per day of NOx and/or ROC.
b. Equals or exceeds the state or federal ambient air quality standard for any criteria pollutant (as determined by modeling).
c. Results in toxic or hazardous pollutants in amounts which may increase cancer risks for the affected population.

Cumulative air quality impacts and consistency with the policies and measures in the Air Quality Supplement of the Comprehensive Plan, other general plans, and the Air Quality Attainment Plan (AQAP) should be determined for all projects (i.e., whether the project exceeds the AQAP standards).

~~The City thresholds also state that toxic or hazardous air pollutants in amounts which may increase cancer risks for the affected population should be discussed as applicable.~~

The following significance thresholds have been established by the Santa Barbara County APCD (Scope and Content of Air Quality Sections in Environmental Documents, SPCAPCD, 2010). While the City of Goleta has not yet adopted any new threshold criteria, these APCD thresholds are considered appropriate for use as a guideline for the impact analysis.

APCD Operational Impacts Thresholds

Based on APCD Thresholds, t~~T~~he project would result in a significant impact, either individually or cumulatively, if it would:

d. Emit 240 pounds per day or more of ROG and NO_x from all sources;
e. Emit 25 pounds per day or more of unmitigated ROG from any motor vehicle trips only;
f. Emit 25 pounds per day or more of unmitigated NO_x from any motor vehicle trips only;
g. Emit 80 pounds per day or more of PM-10;
h. Cause or contribute to a violation of any California or National Ambient Air Quality standard (except ozone);
i. Exceed the APCD health risk public notification thresholds adopted by the APCD Board (10 excess cancer cases in a million for cancer risk and a Hazard Index of more than 1.0 for non-cancer risk); or
j. Be inconsistent with Federal or State air quality plans for Santa Barbara County.

The cumulative contribution of project emissions to regional levels should be compared with existing programs and plans, including the most recent Clean Air Plan (CAP; 2010).

k. Due to the County~~'~~ non-attainment status for ozone and the regional nature of ozone as a pollutant, if a project's emissions from traffic sources of either of the ozone precursors (NOx or ROC), exceed the operational thresholds, then the projects' cumulative impacts are considered significant.

l. For projects that do not have significant ozone precursor emissions or localized pollutant impacts, if emissions have been taken into account in the 2010 CAP growth projections, regional cumulative impacts may be considered to be less than significant.

The Willow Springs II project is accounted for in the 2010 CAP growth projections (see below).

APCD Construction Impacts Thresholds

Quantitative thresholds of significance are not currently in place for short-term emissions. However, short-term impacts such as exhaust emissions from construction equipment and fugitive dust generation during grading must be discussed. In the interest of public disclosure, the APCD recommends that construction-related NO_x, ROC, PM-10, and PM-2.5 emissions, from diesel and gasoline powered equipment, paving, and other activities, be quantified.

m. The APCD uses 25 tons per year for NO_x and ROC as a guideline for determining the significance of construction impacts.

Under APCD Rule 202 D.16 (APCD, Rule 202, 2012), if the combined emissions from all construction equipment used to construct a stationary source which requires an Authority to Construct permit, have the potential to exceed 25 tons of any pollutant, except carbon monoxide, in a 12-month period, the permittee shall provide offsets under the provisions of Rule

804 (APCD, Rule 804, 2012) and shall demonstrate that no ambient air quality standard will be violated.

4.2.2 Project Impacts

There are a number of modeling tools that can be used to quantify potential criteria pollutant emissions associated with various project types. The Urban Emissions Model (URBEMIS), URBEMIS 2007 (version 9.2.4), which is the most current version available, was used for the analysis in this EIR. The URBEMIS air quality modeling software was designed to model emissions associated with development of urban land uses, and attempts to summarize criteria air pollutants and carbon dioxide (CO_2) emissions that would occur during construction and operation of new development. This model is publicly available and widely used by CEQA practitioners and air districts, including the CARB. While the newest air quality modeling tool is the California Emissions Estimator Model (CalEEMod) version CalEEMod.2011.1.1, which updated emission factors and default values, the most consistently used model for quantifying potential criteria pollutant is URBEMIS. Therefore, URBEMIS is a relevant and appropriate air quality modeling tool to be used to calculate criteria air pollutants and carbon dioxide (CO_2) emissions. Section 4.6 *Greenhouse Gas Emissions* provides the analysis for greenhouse gas emissions based on CO_2 equivalent emissions that would occur during construction and operation of the project.

Construction Period Impacts[1]

Temporary construction activity emissions would occur during project build-out. Such emissions include on-site generation of dust and equipment exhaust from grading, and construction activities, and off-site emissions from construction employee commuting and/or trucks delivering building materials or fill soils.

Construction activity emissions are difficult to quantify, since the exact type and amount of equipment that will be used or the acreage that may be disturbed on any given day in the future is not known with any reasonable certainty. The emphasis in environmental documents relative to construction activity emission impacts has therefore been to minimize the emissions as fully as possible through comprehensive mitigation even if the exact amount of emissions cannot be precisely quantified. Though no quantitative threshold has been established for short-term construction-related emissions, an analysis is nevertheless provided below.

Dust is normally the primary concern during construction of new buildings and infrastructure. Because such emissions are not amenable to collection and discharge through a controlled source, they are called “fugitive emissions.” Emission rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance, or excavation, etc.). These parameters are not known with any reasonable certainty prior to project development and may change from day to day. Any assignment of specific parameters to an unknown future date is speculative and conjectural.

Because of the inherent uncertainty in the predictive factors for estimating fugitive dust generation, regulatory agencies typically use one universal "default" factor based on the area disturbed assuming that all other input parameters into emission rate prediction fall into mid-

[1] Addresses Thresholds “a”, “b”, “c”, and “m”

range average values. This assumption may or may not necessarily be applicable to site-specific conditions on the project site.

Dust control measures include use of enhanced dust control procedures such as continual soil wetting, use of supplemental binders, early paving, etc. can achieve a significant improvement in PM-10 control efficiency. With the use of such control measures the California Air Resources Board (CARB) URBEMIS_2007 computer model predicts that emissions can be reduced to 1-2 pounds per acre of disturbance per day. The non-attainment status of Santa Barbara County for PM-10 dictates that all available mitigation measures should be implemented during grading and construction activities. Recommended PM-10 mitigation measures are included in the mitigation section, below.

Current research in particulate exposure health effects suggest that the most adverse effect derives from ultra-small diameter particulate matter comprised of chemically reactive pollutants such as sulfates, nitrates, or organic material. A new Federal clean air standard for particulate matter of 2.5 microns or smaller in diameter (PM-2.5) was adopted in 1997. Very little construction activity particulate matter is in the PM-2.5 range. Soil dust is also more chemically benign than typical urban atmospheric PM-2.5. Given the limited amount of PM-2.5 within the limited project PM-10 burden, significant air quality impacts associated with PM-2.5 during project construction are not anticipated.

Construction equipment exhaust contains carcinogenic compounds within the diesel exhaust particulates. The toxicity of diesel exhaust is evaluated relative to a 24 hours per day, 365 days per year, 70-year lifetime exposure. Public exposure to heavy equipment operating in the distance will be an extremely small fraction of the above dosage assumption. Therefore, construction of the project is not expected to result in a significant public health risk associated with project-related heavy equipment operations exhaust. It is noted that diesel equipment is also becoming progressively "cleaner" in response to statewide air quality rules on new off-road equipment, and that the incorporation of biodiesel-fueled or oxidation catalyst equipment would lower diesel particulate emissions from construction activities.

Construction activity air quality impacts occur mainly in close proximity to the surface disturbance area. There may, however, be some "spill-over" into the surrounding community. That spill-over may occur as vehicles drop or carry out dirt or as silt is washed into public streets. Passing non-project vehicles then pulverize the dirt to create off-site dust impacts. Spill-over may also occur through traffic congestion effects due to the addition of construction vehicles (trucks and contractor employee commuting) to existing ambient traffic volume. Emissions controls require good housekeeping procedures and a construction traffic management plan that will maintain such "spill-over" effects at a less-than-significant level.

Exhaust emissions will result from on and off-site heavy equipment. The types and numbers of equipment will vary among contractors such that these emissions cannot be quantified with certainty. Initial grading will gradually shift toward building construction and then for finish construction, paving, landscaping, etc. The URBEMIS_2007 computer model was used to calculate emissions from the prototype construction equipment fleet and grading information listed in **Table 4.2-4**.

Table 4.2-4
Project Equipment Fleet

Grading	1 Grader
	1 Tractor/Loader/Backhoe
	1 Dozer
	1 Water Truck
	On-Road Trucks
Construction	2 Forklifts
	1 Tractor/Loader/Backhoe
	1 Crane
	1 Generator Set
	3 Welders
Paving	1 Paving Equipment
	1 Paver
	1 Roller
	1 Tractor/Loader/Backhoe
	4 Cement Mixers

Grading Quantities:

- On-site cut/fill 36,325 CY of earthwork including embankment area
- Import 15,475 CY of earthwork

Utilizing the prototype equipment fleet and earthwork listed in Table 4.2-4, emissions were calculated by URBEMIS_2007 and are shown in **Table 4.2-5**.

Table 4.2-5
Construction Activity Emissions (pounds/day)

Activity	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2
Grading							
No Mitigation	3.7	35.6	17.0	0.0	121.7	26.6	3,748.7
With Mitigation	3.7	31.8	17.0	0.0	12.6	3.0	3,748.7
Construction, Painting and Paving							
No Mitigation	59.9	17.8	20.9	0.0	1.4	1.2	2,515.2
With Mitigation	54.2	15.4	20.9	0.0	0.3	0.2	2,515.2
APCD Guideline	-	-	-	-	-	-	-
Source: URBEMIS2007 Model, Output in **Appendix A**.							

Thresholds for all emissions from construction equipment are established by the APCD on a tons per year basis. It was assumed that site grading would require 2 months and construction paving and painting would require 8 months. Based on this schedule, URBEMIS_2007 determined the annual emissions as shown in **Table 4.2-6**.

Table 4.2-6
Construction Activity Emissions (tons/year)

Activity	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2
Grading							
No Mitigation	0.08	0.78	0.37	0.00	2.68	0.58	82.47
With Mitigation	0.08	0.70	0.37	0.00	0.28	0.07	82.47
Construction, Painting and Paving							
No Mitigation	1.54	1.48	162	0.00	0.11	0.10	195.11
With Mitigation	1.41	1.28	1.62	0.00	0.02	0.02	195.11
APCD Guideline	25	25	-	-	-	-	-
Source: URBEMIS2007 Model, Output in **Appendix A**.							

Peak annual construction activity emissions will be below the 25 tons per year APCD guidelines for ROG and NO_x under Rule 202 D.16. Mitigation measures to reduce emissions are provided as recommendations.

Operational Impacts[2]

Long-term project emissions primarily stem from motor vehicles associated with the project, as there are no stationary sources proposed that would require permits from the APCD. The project is predicted to generate 672 new trip ends per day, with an associated VMT (Vehicle Miles Traveled) of 4,872. Operational and area source emissions for the project were calculated using the computerized procedure developed by the CARB for urban growth mobile source emissions. The URBEMIS_2007 model was run using the trip generation factors specified in the traffic study for this project. The model was used to calculate area source emissions from the operation of the proposed new buildings (e.g. heating, air conditioning) and the resulting vehicular operational emissions associated with the daily trips to and from the site. The results are shown below in **Table 4.2-7**.

Table 4.2-7
Project Operations and Area Source Emissions (pounds/day)

	Emissions (lbs/day)						
Year 2011	**ROG**	**NOx**	**CO**	**SO2**	**PM-10**	**PM-2.5**	**CO2**
Area Sources	5.7	0.8	1.9	0.0	0.0	0.0	965.5
Mobile Sources	5.8	7.2	64.9	0.0	8.4	1.6	4,437.7
Total	**11.5**	**8.0**	**66.8**	**0.0**	**8.4**	**1.6**	**5,403.2**
APCD Guideline	25*	25*	N/A	N/A	80		
*transportation (mobile) sources only URBEMIS2007 Air Quality Model; Output in **Appendix A**.							

The project will not cause any recommended guideline levels to be exceeded as indicated in Table 4.2-7. Therefore, project operational air quality impacts would be considered less than significant.

[2] Addresses Thresholds "a", "b", "d"-"h", and "j"

Health Risk Assessment Regarding Exposure to Toxic Air Contaminants[3]

The project would be located adjacent to an existing industrial area along Aero Camino to the east and near business parks and general commercial uses to the east, southwest, and west. In preparation of this analysis, Giroux & Associates contacted the APCD, which confirmed that there are no identified stationary toxic sources near the project site (Giroux, 2010). The nearest source, the Ellwood Onshore Facility owned by Venoco Inc., is located at 7979 Hollister Avenue and is more than 3.5 miles from the Willow Springs II project site. Therefore, for purposes of this analysis, the risk associated with toxic air contaminants at this project site is considered less than significant. Section 4.7 *Hazards and Hazardous Materials* provides more discussion relative to potential air toxic hazards from adjacent Aero Camino industrial area.

Consistency with Air Quality Planning[4]

General growth, such as the project, is not explicitly incorporated into the 2010 Clean Air Plan (CAP), which is the County's plan to achieve attainment status of the ozone standard. General development is, however, indirectly incorporated into air quality planning through the growth projections and regional transportation plans prepared by the Santa Barbara County Association of Governments. If it can be demonstrated that the project represents forecast growth for Goleta, the project would not be considered to impede the continued maintenance of the one-hour Federal ozone standard or ultimate attainment of the 8-hour standard.

The ~~2006~~ Goleta General Plan/Coastal Land Use Plan Final Environmental Impact Report (SCH #2005031151) allowed development of an additional 3,880 residential units at full build-out. An update to the Goleta General Plan/Coastal Land Use Plan (General Plan), dated November 2010 ~~June 2009~~, reported a remaining need of 938 ~~1,641~~ units in the City for the 2007 to 2014 planning period based on SBCAG's Regional Housing Need Allocation (RHNA). This project's 100 units would be located in a medium density area in the General Plan Land Use Plan Map (General Plan Figure 2-1, 11/08) and provide 2.6% of the housing developments allowed by the General Plan, or 6.1% of the projected housing need for the current planning period. Both the density and magnitude of the project are consistent with the General Plan. Therefore, the project is consistent with the 2010 CAP by virtue of its consistency with General Plan growth projections and impacts related to planning consistency would be less than significant.

4.2.3 Cumulative Impacts[5]

The significance thresholds used for this analysis are intended to address cumulative air quality impacts. Due to the County's non-attainment status for ozone and the regional nature of the pollutant, if a project's total emissions of the ozone precursors, NOx or ROG**,** exceed the long-term threshold of 25 lbs. per day, then the project's cumulative impacts would be considered significant. As per Table 4.2-7, the project would not exceed any of these thresholds and therefore, the project's contribution to cumulative air quality impacts is considered less than significant.

[3] Addresses Thresholds "c" and "i"

[4] Addresses Thresholds "j" and "l"

[5] Addresses Thresholds "a", "k", and "l"

4.2.4 Mitigation Measures

Recommended Mitigation Measures for Construction Period Impacts

AQ 1-1 Dust generated by construction and/or demolition activities shall be kept to a minimum.

Plan Requirements: The following dust control measures shall be shown on all building and grading plans and the permittee shall ensure that these measures are implemented by the contractor/builder:

a. During clearing, grading, earth moving, excavation, and/or transportation of cut or fill materials, water trucks or sprinkler systems are to be used to prevent dust from leaving the site and to create a crust after each day's activities.

b. During construction, water trucks or sprinkler systems shall be used to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this would include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency shall occur whenever wind exceeds 15 miles per hour. If wind speeds increase to the point at which such measures cannot prevent dust from leaving the site, construction activities shall be suspended.

c. Minimize amount of disturbed area, to reduce the total area generating dust, and ~~reduce~~ onsite vehicle speeds shall be ~~to~~ 15 miles per hour or less.

d. Gravel pads, knock-off plates, or similar BMPs, shall be installed at all access points to the project site to prevent tracking of mud onto roadways.

e. Soil stockpiled for more than two days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting soil material to and from the site shall be tarped from the point of origin.

f. All gravel, dirt, and construction material shall be cleaned from the right-of-way at a minimum of once a day at the end of the work day.

g. After clearing, grading, earth moving, and/or excavation is complete, the disturbed area shall be treated by watering, or revegetating, or by spreading soil binders until the area is paved or otherwise developed in a manner that prevents dust generation.

The permittee shall ensure that the contractor or builder designates a person or persons to monitor the dust control program and to order increased watering as necessary to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to City staff and the APCD and shall be posted in three locations along the project site's perimeter for the duration of grading and construction activities. **Timing:** All requirements shall be noted on all project ~~clearance~~ plans as determined necessary by City staff, including the grading and construction plans, and shall be reviewed and approved by City staff prior to any LUP issuance for grading and any LUP issuance for construction. Requirements shall be adhered to throughout all grading and construction periods.

Monitoring: City staff shall ensure measures are printed on plans and shall periodically site inspect to ensure compliance. APCD inspectors will respond to nuisance complaints.

AQ 1-2 Grading and construction contracts shall ~~must~~ specify that contractors shall adhere to requirements that reduce emissions of ozone precursors and particulate emissions from diesel exhaust.

Plan Requirements: The following shall apply:

a. All portable diesel-powered construction equipment shall be registered with the state's portable equipment registration program OR shall obtain an APCD permit.

b. Fleet owners of mobile construction equipment are subject to the California Air Resources Board (CARB) Regulation for In-use Off-road Diesel Vehicles (Title 13, California Code of Regulations, Chapter 9, Section 2449).

c. All commercial diesel vehicles are subject to limitations on idling time (Title 13, California Code of Regulations, Chapter 9, Section 2485). Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to five minutes. Electric auxiliary power units shall ~~should~~ be used, unless otherwise approved by the City ~~whenever possible~~.

d. Diesel construction equipment meeting the CARB Tier 1 emission standards for off-road heavy-duty diesel engines shall be used, except that any available . ~~e~~Equipment meeting CARB Tier 2 or higher emission standards shall ~~should~~ be used, unless otherwise approved by the City ~~to the maximum extent feasible~~.

e. Diesel powered equipment shall ~~should~~ be replaced by electric equipment, unless otherwise approved by the City ~~whenever feasible~~.

f. ~~If feasible,~~ D~~d~~iesel construction equipment shall be equipped with selective catalytic reduction systems, diesel oxidation catalysts, and diesel particulate filters as certified and/or verified by CARB or the EPA, unless otherwise approved by the City.

g. Catalytic converters shall be installed on gasoline-powered equipment, unless otherwise approved by the City ~~if feasible~~.

h. All construction equipment shall be maintained in tune per the manufacturer's specifications.

i. The engine size of construction equipment shall be the minimum practical size.

j. The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time.

k. Construction worker trips shall ~~should~~ be minimized by requiring carpooling and by providing lunch onsite, unless otherwise approved by the City.

l. Coatings (e.g. paints) shall be labeled as "low-VOC" or "zero-VOC" in accordance with EPA rules for interior and exterior surfaces.

Timing: All requirements shall be noted on all project ~~clearance~~ plans as determined necessary by City staff, including the grading and construction plans,

and shall be reviewed and approved by City staff prior to any LUP issuance for grading and any LUP issuance for construction. Requirements shall be adhered to throughout all grading and construction periods.

Monitoring: City staff shall ensure measures are printed on plans and shall periodically site inspect to ensure compliance. APCD inspectors will respond to nuisance complaints.

AQ 1-3 Diesel fuel emissions shall be limited.

Plan Requirements: The following limitations on diesel-fueled vehicles in excess of 10,000 pounds shall apply during all construction and subsequent operational activities:

a. Diesel-fueled vehicles in excess of 10,000 pounds shall not idle in one location for more than five (5) minutes at a time.
b. Diesel-fueled vehicles in excess of 10,000 pounds shall not use diesel-fueled auxiliary power units for more than five (5) minutes to power heater, air conditioner, or other ancillary equipment on any such vehicle.
c. The permittee shall designate one or more locations as deemed appropriate, for the permanent posting of a notice(s) to all drivers of diesel-fueled vehicles in excess of 10,000 pounds of these limitations on vehicle idling in all areas of the property that may be frequented by such vehicles. Such signs shall ~~will~~ be maintained in their approved location(s) as long as diesel-fueled vehicles in excess of 10,000 pounds are being used.

Timing: All requirements shall be noted on all project ~~clearance~~ plans as determined necessary by City staff, including grading and construction plans, and shall be reviewed and approved by City staff prior to any LUP issuance for grading and any LUP issuance for construction. Requirements shall be adhered to throughout all grading and construction periods. The location and information provided on the sign(s) shall be reviewed and approved by City staff prior to any LUP issuance for grading.

Monitoring: City staff shall ensure measures are printed on plans and shall periodically site inspect to ensure compliance. APCD inspectors will respond to nuisance complaints.

4.2.5 Residual Impacts

The project's air quality-related impacts are adverse, but less than significant prior to mitigation (**Class III**). Therefore, the project would not result in any significant residual air quality impacts. Although not required to reduce impacts to less than significant levels, the mitigation measures above are recommended to minimize adverse, but less than significant air quality impacts.

For discussion of greenhouse gas emissions, please refer to Section 4.6 of this document.