

3.5 AIR QUALITY

This section describes the environment and setting in and around the sublease boundary that would be affected by the proposed action; describes the criteria used for a determination of the levels of significance regarding the discharge of air quality pollutants; analyzes the consequences and effects that each alternative would have on the ambient air quality within the sublease boundary; and discusses applicable mitigation measures.

3.5.1 AFFECTED ENVIRONMENT

“Air Pollution” is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants may adversely affect human or animal health and reduce visibility. Seven air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern nationwide: carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter equal to or less than 2.5 microns in diameter (PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). These pollutants are collectively referred to as criteria pollutants. The sources of these pollutants, their effects on human health and the nation’s welfare, and their final deposition in the atmosphere vary considerably.

The South Coast Air Quality Management District (SCAQMD) maintains a network of air quality monitoring stations located throughout the region and has divided the South Coast Air Basin into air monitoring areas. The closest air quality monitoring station is at Pico Rivera, identified by SCAQMD as the South San Gabriel Valley source-receptor area, approximately three miles southwest of the project site. Table 3.5-1 summarizes the maximum and average pollutant levels and the exceedances of standards recorded at this station for the years 2006 through 2008.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. The California Air Resources Board (ARB) has identified the following groups who are most likely to be affected by air pollution: children under 14, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

Sensitive air quality receptors surrounding the sublease boundary include residential uses to the west, South El Monte High School to the north, and park users within the sublease boundary and within the Natural Area to the south, east, and west. Additionally, once the interpretive center is in operation, sensitive receptors would be utilizing the facility. Sensitive receptors within the vicinity of the sublease boundary include the following:

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- The multi-family homes west of the sublease boundary and south of Durfee Avenue. The closest point of these homes is approximately 55 feet west of the sublease boundary. There is a commercial building between the homes and the proposed site of the interpretive center.
- South El Monte High School across from the sublease boundary on the north side of Durfee Avenue. The closest point from the construction impact area to the athletic fields is approximately 100 feet; it is approximately 250 feet to the nearest school building.
- During construction and when construction has been completed, sublease boundary visitors and staff would be sensitive receptors.

TABLE 3.5-1 AMBIENT AIR QUALITY AT THE SOUTH SAN GABRIEL/PICO-RIVERA MONITORING STATION

Pollutant	Pollutant Concentration & Standards	2006	2007	2008
Ozone	Maximum 1-hr Concentration (ppm)	0.130	0.0135	0.0107
	Days > 0.09 ppm (state 1-hr standard)	9	6	6
	Maximum 8-hr Concentration (ppm)	0.095	0.100	0.094
	Days > 0.070 ppm (state 8-hr standard)	9	9	12
Carbon Monoxide	Maximum 1-hr concentration (ppm)	3	5	--
	Days > 20 ppm (state 1-hr standard)	0	0	0
	Maximum 8-hr concentration (ppm)	2.7	2.9	1.9
	Days > 9.0 ppm (state 8-hr standard)	0	0	0
Nitrogen Dioxide	Maximum 1-hr Concentration (ppm)	0.10	0.11	0.09
	Days > 0.18 ppm (state 1-hr standard)	0	0	0
PM ₁₀ ¹	Maximum 24-hr concentration (µg/m ³)	--	--	--
	Estimated Days > 50 µg/m ³ (state 24-hr standard)	--	--	--
PM _{2.5}	Maximum 24-hour concentration (µg/m ³)	72.2	63.6	40.9
	Annual Average (µg/m ³)	16.6	16.6	--
	Exceed state Standard (12 µg/m ³)?	Yes	Yes	Yes
Sulfur Dioxide	Maximum 24-hr Concentration (ppm)	--	--	--
	Days > 0.04 ppm (state 24-hr standard)	--	--	--

-- Insufficient data or no data available to determine the value.

Source: SCAQMD 2008.

3.5.2 REGULATORY FRAMEWORK

The federal Clean Air Act governs air quality in the United States. In addition to being subject to the requirements of federal Clean Air Act, air quality in California is also governed by more stringent regulations under the California Clean Air Act. At the federal level, federal Clean Air Act is administered by the EPA. In California, the California Clean Air Act is administered by ARB at the state level and by the air quality management districts and air pollution control districts at the regional and local levels.

United States Environmental Protection Agency. EPA is responsible for enforcing the federal Clean Air Act. EPA is also responsible for establishing the National Ambient Air Quality Standards. National

Ambient Air Quality Standards are required under the 1977 Clean Air Act and subsequent amendments. EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. EPA has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet stricter emission standards established by ARB.

California Air Resources Board. ARB, which became part of the California Environmental Protection Agency in 1991, is responsible for meeting the state requirements of the federal Clean Air Act, administering the California Clean Air Act, and establishing the California Ambient Air Quality Standards. The California Clean Air Act, as amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the California Ambient Air Quality Standards. The California Ambient Air Quality Standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. ARB regulates mobile air pollution sources, such as motor vehicles. ARB is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. ARB established passenger vehicle fuel specifications, which became effective in March 1996. ARB oversees the functions of local air pollution control districts and air quality management districts, which in turn, administer air quality activities at the regional and county levels.

South Coast Air Quality Management District. The SCAQMD monitors air quality within the project area. The SCAQMD has jurisdiction over an area of 10,743 square miles, consisting of Orange County; the non-desert portions of Los Angeles, Riverside, and San Bernardino counties; and the Riverside County portion of the Salton Sea Air Basin and Mojave Desert Air Basin. The 1977 Lewis Air Quality Management Act created the SCAQMD to coordinate air quality planning efforts throughout Southern California. This act merged four county air pollution control agencies into one regional district to better address the issue of improving air quality in Southern California. Under the act, renamed the Lewis-Presley Air Quality Management Act in 1988, the SCAQMD is the agency principally responsible for comprehensive air pollution control in the region. Specifically, the SCAQMD is responsible for monitoring air quality, as well as planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. Programs that were developed include air quality rules and regulations that regulate stationary sources, area sources, point sources, and certain mobile source emissions. SCAQMD is also responsible for establishing stationary source permitting requirements and for ensuring that new, modified, or relocated stationary sources do not create net emission increases.

The South Coast Air Basin is a subregion of the SCAQMD and covers an area of 6,745 square miles. The South Coast Air Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The South Coast Air Basin is bounded by the Pacific Ocean to

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the west; the San Gabriel, San Bernardino and San Jacinto Mountains to the north and east; and the San Diego County line to the south.

NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS

As required by the federal Clean Air Act, the National Ambient Air Quality Standards have been established for seven major air pollutants: CO, NO₂, O₃, PM_{2.5}, PM₁₀, SO₂, and Pb. The federal Clean Air Act requires EPA to designate areas as either attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the National Ambient Air Quality Standards have been achieved. The EPA has classified the South Coast Air Basin as, maintenance for CO and nonattainment for O₃, PM_{2.5}, and PM₁₀. As discussed above, the California Ambient Air Quality Standards are generally more stringent than the corresponding federal standards (National Ambient Air Quality Standards) and, therefore, are used as the comparative standard in the air quality analysis contained in this report. The state and federal standards are summarized in Table 3.5-2.

The California Clean Air Act requires ARB to designate areas within California as either attainment or non-attainment for each criteria pollutant based on whether the California Ambient Air Quality Standards have been achieved. Under the California Ambient Air Quality Standards, areas are designated as non-attainment for a pollutant if air quality data shows that a state standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a state standard and are not used as a basis for designating areas as nonattainment. Under the California Ambient Air Quality Standards, the Los Angeles County portion of the South Coast Air Basin is designated as a nonattainment area for O₃, PM_{2.5}, and PM₁₀ (ARB 2008). Attainment status for the South Coast Air Basin is summarized in Table 3-5.3.

TABLE 3.5-2 NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	NAAQS ¹		CAAQS ²		
		Primary ³	Secondary ⁴	Concentration ⁵		
Ozone (O ₃) ⁶	1-Hour	–	Same as	0.09 ppm (180 µg/m ³)		
	8-Hour	0.075 ppm (147 µg/m ³)	Primary Standard	0.070 ppm (137 µg/m ³) ⁹		
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m ³)	None	9.0 ppm (10 mg/m ³)		
	1-Hour	35 ppm (40 mg/m ³)		20 ppm (23 mg/m ³)		
	8-Hour (Lake Tahoe)	–		6 ppm (7 mg/m ³)		
Nitrogen Dioxide (NO ₂)	Annual Average	0.053 ppm (100 µg/m ³)	Same as	0.030 ppm (57 µg/m ³) ¹⁰		
	1-Hour	–	Primary Standard	0.18 ppm (339 µg/m ³) ¹⁰		
Sulfur Dioxide (SO ₂)	Annual Average	0.030 ppm (80 µg/m ³)	–	–		
	24-Hour	0.14 ppm (365 µg/m ³)	–	0.04 ppm (105 µg/m ³)		
	3-Hour	–	0.5 ppm (1300 µg/m ³)	–		
	1-Hour	–	–	0.25 ppm (655 µg/m ³)		
Respirable Particulate Matter (PM ₁₀) ⁷	24-Hour	150 µg/m ³	Same as Primary Standard	50 µg/m ³		
	Annual Arithmetic Mean	Revoked		20 µg/m ³ note 7		
Fine Particulate Matter (PM _{2.5}) ⁸	24-Hour	35 µg/m ³	Same as Primary Standard	–		
	Annual Arithmetic Mean	15 µg/m ³		12 µg/m ³		
Lead (Pb)	30-Day Average	–	–	1.5 µg/m ³		
	Calendar Quarter	1.5 µg/m ³	Same as Primary Standard	–		
	Rolling 3-Month Average	0.15 µg/m ³	Same as Primary Standard	–		
Hydrogen Sulfide (H ₂ S)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m ³)		
Sulfates (SO ₄)	24-Hour			25 µg/m ³		
Visibility Reducing Particles	8-Hour (10 AM to 6 PM, Pacific Standard Time)					Extinction coefficient of 0.23 per km-visibility of ten miles or more (0.07/30 miles for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.
Vinyl chloride ⁹	24-Hour			0.01 ppm (26 µg/m ³)		

¹ NAAQS (other than O₃, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O₃ standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

² California Ambient Air Quality Standards for O₃, CO (except Lake Tahoe), SO₂ (1- and 24-hour), NO₂, PM₁₀, PM_{2.5}, and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

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

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

⁵ Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

⁶ On June 15, 2005, the 1-hour ozone standard was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact Areas (those areas do not yet have an effective date for their 8-hour designations). Additional information on federal ozone standards is available at <http://www.epa.gov/oar/oaqps/greenbk/index.html>.

⁷ Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the EPA revoked the annual PM₁₀ standard on December 17, 2006.

⁸ Effective December 17, 2006, the EPA lowered the PM_{2.5} 24-hour standard from 65 µg/m³ to 35 µg/m³.

⁹ 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.

¹⁰ The nitrogen dioxide ambient air quality standard was amended to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes became effective March 20, 2008.

ppm = parts per million; µg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; km = kilometers
Source: ARB 2008b.

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TABLE 3.5-3 ATTAINMENT FOR THE SOUTH COAST AIR BASIN

Pollutant	Attainment Status	
	Federal	State
O ₃ (1 ¹ - and 8-hour)	Nonattainment	Nonattainment
PM ₁₀	Nonattainment	Nonattainment
PM _{2.5}	Nonattainment	Nonattainment
CO	Attainment/Maintenance	Attainment
NO ₂	Attainment	Attainment
SO ₂	Attainment	Attainment
Pb	Attainment	Attainment

¹ Federal 1-hour O₃ repealed by law with implementation of the 8-hour standard.

Source: EPA 2008b; ARB 2008.

3.5.3 METHODOLOGY

For this proposed action, emissions of reactive organic compounds (ROC), oxides of nitrogen (NO_x), CO, PM₁₀, PM_{2.5}, and CO₂ were calculated using the URBEMIS2007 software package, version 9.2.4 (Rimpo and Associates 2008). The emissions factors and calculation methodologies contained in the URBEMIS2007 program have been approved for use by the SCAQMD. URBEMIS is a calculation tool designed to estimate air emissions from land use development projects based on development type and size. The model contains data that are specific for the SCAQMD and Los Angeles County. Inputs include each land use type and size in terms of building area, number of dwelling units, number of hotel rooms, etc., and the vehicle trip generation for each land use. Appendix D contains the worksheets documenting the input and output for this analysis.

Trip generation data were provided by Iteris, Inc. (see Appendix E); net weekday trip generation is estimated at 1,096 trips per day. It is assumed that the new interpretive center would be operational in 2013.

3.5.4 CRITERIA FOR SIGNIFICANCE OF EFFECTS

Specific geographic areas are classified under the federal Clean Air Act as either “attainment” or “nonattainment” for each pollutant, based on conformance with or violation of the National Ambient Air Quality Standards. The General Conformity Rule applies to actions that generate emissions in federal nonattainment or maintenance areas. The site is located within the South Coast Air Basin, which is a federal nonattainment area for O₃, PM₁₀, and PM_{2.5} and a maintenance area for CO. Therefore, the General Conformity Rule is applicable at the project location. The General Conformity Rule requires analysis of emissions of criteria pollutants and their precursors for which an area is designated nonattainment or that are covered by a maintenance plan. The proposed action would include construction equipment and mobile sources that would emit ROC, NO_x, PM₁₀, PM_{2.5}, and CO. VOC and NO_x are the precursors of O₃. Therefore, the General Conformity Rule is applicable to these emissions.

The EPA has determined specific federal actions, or portions thereof, to be exempt from a formal conformity determination. Actions are exempt where the total net increase of all reasonably foreseeable direct and indirect emissions (1) would be less than specified emission rate thresholds, known as *de minimis* limits, and (2) would be less than 10 percent of the area's annual emission budget. The *de minimis* thresholds applicable to the South Coast Air Basin are shown in Table 3.5-4.

TABLE 3.5-4 GENERAL CONFORMITY RULE THRESHOLD LIMITS FOR CRITERIA POLLUTANTS

Pollutant	Emissions (tons/year)
ROC	25
NO _x	25
PM ₁₀	70
PM _{2.5}	100
CO	100

Source: EPA 2006a

3.5.5 PROJECT EFFECTS ON AIR QUALITY

3.5.5.1 NO ACTION ALTERNATIVE

This alternative would involve no change in existing conditions. As such, air pollutant emissions associated with construction and use of the sublease boundary would be avoided. With no change in existing conditions, there is no potential for air pollutant emissions to exceed the thresholds described above. There would be no direct, indirect, or cumulative effects to air quality under No Action Alternative.

3.5.5.2 18,230 SF ALTERNATIVE

The 18,230 sf Alternative represents the largest proposed building size and construction impact area. As such, this alternative represents the worst-case air quality scenario of the build alternatives.

CONSTRUCTION

Assumptions for the equipment used, volumes of demolition removal and fill import, and other factors are included in the URBEMIS input-output data sheets in Appendix D. It is mandatory for all construction projects in the South Coast Air Basin to comply with SCAQMD Rule 403 for fugitive dust (SCAQMD 2005). Specifically, Rule 403 control requirements include, but are not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, re-establishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, and maintaining

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effective cover over exposed areas. The calculations for the construction-related air emissions associated with the 18,230 sf Alternative, including compliance with Rule 403, are shown in Table 3.5-5.

TABLE 3.5-5 CONSTRUCTION EMISSIONS

Phase and Year of Construction	ROC	NO _x	CO	SO _x ¹	PM ₁₀	PM _{2.5}
	Emissions – Tons per year					
Demolition – October 2011	0.01	0.09	0.06	<0.01	0.04	0.01
Grading – October – December 2011	0.06	0.51	0.30	<0.01	0.022	0.06
Total emissions - 2011	0.07	0.60	0.36	<0.01	0.26	0.08
Grading – January – March 2012	0.07	0.54	0.32	<0.01	0.25	0.07
Asphalt Pavung – March – April 2012	0.01	0.07	0.06	<0.01	0.01	0.01
Building – March – December 2012	0.35	1.86	1.43	<0.01	0.13	0.12
Total emissions - 2012	0.43	2.48	1.82	<0.01	0.38	0.19
Building – January – March 2013	0.08	0.44	0.36	<0.01	0.03	0.03
Coating – February – March 2013	0.22	<0.01	<0.01	<0.01	<0.01	<0.01
Maximum annual construction emissions	0.31	0.44	0.36	<0.01	0.03	0.03
<i>General Conformity Rule de minimis Thresholds- from Table 3.5-4</i>	25	25	100	100	70	100
<i>Exceed threshold?</i>	No	No	No	No	No	No
<i>Forecast emissions for Los Angeles County for 2015</i>	128,060	156,205	557,078	23,309	68,857	25,875
<i>Exceed 10% of regional emissions?</i>	No	No	No	No	No	No

1- SO₂ is an attainment pollutant; SO_x emissions are included for NEPA analysis.

As shown in Table 3.5-5, construction emissions associated with the 18,230 sf Alternative would not exceed the General Conformity Rule *de minimis* thresholds or exceed 10 percent of the projected County forecast emission. No substantial direct or indirect adverse impact would occur from construction of the 18,230 sf Alternative.

Cumulative air quality impacts are considered on a regional basis. As such, Table 3.5-5 is used in the analysis of cumulative air quality impacts. Construction of the 18,230 sf Alternative would not exceed emission thresholds for criteria pollutants during the construction phase. No substantial adverse cumulative effect would occur from construction of the 18,230 sf Alternative.

OPERATIONS

Operational emissions come from area sources and mobile sources. Area sources include natural gas for space heating and water heating, gasoline-powered landscaping and maintenance equipment, consumer products such as household cleaners, and architectural coatings for routine maintenance. Mobile sources are vehicle trips that would be made by visitors and staff. Estimated trip generation numbers for the site under this alternative are provided in the project traffic study (see Appendix E). Regional emissions are the total emissions attributed to the project operations, and were calculated using the URBEMIS model. The year of analysis is 2013, the first year of operations, which would have the greatest emissions. Emissions in subsequent years would be less because of the continuing improvement in vehicle emissions

and the retirement of older vehicles. The results of the calculations for operations-related air emissions of the 18,230 sf Alternative are shown in Table 3.5-6. The URBEMIS input-output data sheets are in Appendix D.

TABLE 3.5-6 REGIONAL OPERATIONS EMISSIONS

Sources - 2013	ROC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
	Emissions – Tons per Year					
Area sources	0.06	0.04	0.58	<0.01	<0.01	<0.01
Mobile sources	1.11	1.71	14.11	0.02	3.10	0.60
Total Operations Emissions	1.17	1.75	14.69	0.02	3.10	0.60
<i>General Conformity Rule de minimis Thresholds- from Table 3.5-4</i>	25	25	100	100	70	100
<i>Exceed threshold?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
<i>Forecast emissions for Los Angeles County for 2015</i>	128,060	156,205	557,078	23,309	68,857	25,875
<i>Exceed 10% of regional emissions?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

1- SO₂ is an attainment pollutant; SO_x emissions are included for NEPA analysis.

As shown in Table 3.5-6, operation of the 18,230 sf Alternative would not exceed the General Conformity Rule *de minimis* thresholds or exceed 10 percent of the County's regional projected emissions. No substantial direct, indirect, or cumulative adverse effect would occur from operation of the 18,230 sf Alternative.

GLOBAL CLIMATE CHANGE

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters the Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back to space, but the properties of the radiation have changed from high-frequency solar radiation, to lower-frequency infrared radiation. GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. This radiation that would have otherwise escaped back to space is now "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Without the Greenhouse Effect, Earth would not be able to support life.

Prominent GHGs contributing to the Greenhouse Effect include carbon dioxide (CO₂), methane (CH₄), ozone (O₃), water vapor, nitrous oxide (N₂O), and chlorofluorocarbons (CFCs). Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for an enhancement of the Greenhouse Effect, which have led to a trend of unnatural warming of the Earth's climate, known as global warming or global climate change. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Emissions of CO₂ are byproducts of fossil fuel combustion. Methane, a highly potent GHG, results from off-gassing associated with agricultural

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practices and landfills. Processes that absorb CO₂, often referred to as sinks, include uptake by vegetation and dissolution into the ocean.

Carbon dioxide-equivalent (CO₂e) is a value used to account for different GHGs having different potential to retain infrared radiation in the atmosphere and contribute to the Greenhouse Effect. This is known as the Global Warming Potential of a GHG, and is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in Appendix C, "Calculation Referenced," of the General Reporting Protocol of the California Climate Action Registry, one ton of CH₄ has the same contribution to the Greenhouse Effect as approximately 23 tons of CO₂. Therefore, CH₄ is a much more potent GHG than CO₂. Expressing emissions in carbon-dioxide equivalents takes the Greenhouse Effect contribution of all GHG emissions and converts them to a single unit equivalent to the affect if all emissions were CO₂.

An increase in the generation and emission of GHGs is not itself an adverse environmental effect. Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. The strong majority of the scientific community concurs that global warming will lead to adverse climate change effects around the globe and that the phenomenon is anthropogenic, i.e., caused by humans. Thus, it is the increased accumulation of GHGs in the atmosphere that may result in global climate change that causes adverse environmental effects.

GHG emissions associated with the 18,230 sf Alternative would be generated during construction and operation of the 18,230 sf Alternative. Construction emissions would be associated with vehicle engine exhaust from construction equipment, vendor trips, and employee commute trips. Operational emissions would be associated with area, mobile, and stationary sources. Area-source emissions would be associated with activities such as natural gas use, maintenance of landscaping and grounds, and other sources. Mobile-source emissions of GHGs would include project-generated vehicle trips associated with visitors, employees, and deliveries to the project site. In addition, increases in stationary-source emissions could occur at offsite utility providers associated with electricity generation and water distribution that would supply the proposed action.

GHG emissions generated by the proposed action would predominantly consist of CO₂. Although emissions of other GHGs such as CH₄ and N₂O also contribute to global climate change, these GHGs are emitted in much smaller quantities than CO₂, from the emissions-generating activities associated with the proposed action. This is because mobile sources would be the primary source of GHG emissions associated with the proposed action, and CH₄ and N₂O represent a negligible portion of the GHGs associated with the burning of gasoline and diesel fuel in mobile sources (CCAR 2009).

There is no available adopted or widely accepted methodology for evaluating GHG emissions from new development. In the case of the proposed project, CO₂ emissions associated with construction and operations were modeled using URBEMIS 2007, Version 9.2.4. CO₂ emissions were used as a proxy for

all GHG emissions associated with the proposed project. Indirect emissions associated with energy and water consumption were estimated using methodology recommended in CCAR's current General Reporting Protocol Version 3.1. GHG emissions were estimated for the baseline, or existing conditions, and the completed 18,230 sf Alternative.

Construction under the proposed action would generate a finite quantity of approximately 364 metric tons of CO₂e over the duration of construction activities (estimated between 2011 and 2013). Construction activity would contribute GHG emissions to a much lesser extent than the long-term operation of the proposed action for which emissions occur annually over the lifetime of the project. Buildout of the proposed action site would add approximately 1,096 net vehicle trips per day to the project area (see Chapter 3.14 Traffic). If the total vehicular trips, as well as area-source and offsite stationary-source GHG emissions are considered, operation of the 18,230 sf Alternative would generate total GHG emissions of approximately 2,409 metric tons of CO₂e annually during the lifetime of the project. Table 3.5-7 shows the estimated GHG emissions due to construction and operation of the proposed action.

The interpretive center would be constructed to meet the U.S. Green Building Council's platinum level LEED standards. LEED is a voluntary, national standard for developing and rating high-performance, sustainable buildings, often referred to as "green" buildings. This design approach increases the efficiency of energy, water, and building material use on-site. Green buildings are designed to reduce the impacts on human health and the environment through better siting, design, construction, operation, maintenance, and removal, considering the complete life cycle. Some of the sustainable design features that would be incorporated into the interpretive center include rammed-earth walls, cooling towers, and use of renewable building materials. In addition, the 18,230 sf Alternative site is located along 2 bus routes. The 18,230 sf Alternative would be constructed to exceed Title 24 Energy Efficiency Standards, including the use energy efficient lighting and appliances, among other provisions. The 18,230 sf Alternative would be required to meet County requirements for the separation, collection, and storage of materials for recycling. Although operation of the interpretive center would contribute to GHG emissions, 18,230 sf Alternative design features would limit the 18,230 sf Alternative's contribution.

In preparing the estimates, the following assumptions were applied (see Appendix D for further details):

1. Energy use at the present maintenance building with an area of 826 square feet would be approximately the same as for the new maintenance building with an area of 1,000 square feet. The change from the present to the future would be very small relative to the overall emissions; these buildings were not included in the calculations.
2. Energy use at the present outbuilding and picnic shelter is very small, and would be approximately the same as energy use at the future outdoor classroom, which would also be very small. The change from the present to the future would be very small relative to the overall emissions; these buildings were not included in the calculations.

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3. Although the County Police Substation would be eliminated from the project site, the functions of the police group stationed there would continue elsewhere in the Natural Area; there would be a negligible change in police activity CO₂e emissions resulting from the 18,230 sf Alternative. Further, data on the police activity associated with the WNNC is not readily available.
4. Because of the LEED design, the interpretive center would use 50 percent of the electricity and gas than would be used in a conventional, non-LEED building of the same size.
5. The average one-way trip distance for the WNNC and proposed interpretive center visitors would be 7 miles.
6. The average energy use in the WNNC building would be 8 kilowatt hours per square foot per year.
7. The average water consumption for the current WNNC building is 14 gallons per minute and the average water use for the proposed interpretive center is 75 gallons per minute.

Results of the calculations are shown in Table 3.5-7.

It is assumed that the 18,230 sf Alternative would be operational in 2013. As shown in Table 4-2, the 18,230 sf Alternative would generate approximately 1,807 net new tons per year of CO₂e emissions than are currently generated by the WNNC. Operational GHG emissions generated by the 18,230 sf Alternative represent approximately 0.0003 percent of the statewide emissions in 2004.

As of this writing, no air districts in California, including SCAQMD, have a recommended emission threshold for determining significance associated with GHGs from development projects that are not industrial or stationary in nature. To date there is little guidance and there are no local, regional, state, or federal regulations to establish a criterion for significance to determine the cumulative impacts of GHG emissions on global warming.

TABLE 3.5-7 GREENHOUSE GAS OPERATIONS EMISSIONS

Source	Estimated Emissions (CO ₂ e) ¹ (Metric Tons)
Direct Construction Emissions	
2011	56
2012	257
2013	50
Baseline Operational Emissions (2006)	
Area source	1 TPY
Mobile source	558 TPY
Energy consumption onsite ²	8 TPY
Water consumption (energy for conveyance, treatment, distribution, and wastewater treatment) ³	34 TPY
Total Baseline GHG Emissions	602 TPY
Proposed Operational Emissions (2013)	
Area source	29 TPY
Mobile source	2,171 TPY
Energy consumption onsite ²	27 TPY
Water consumption (energy for conveyance, treatment, distribution, and wastewater treatment) ³	183 TPY
Total Proposed GHG Emissions	2,409 TPY
Net Increase (Project less Baseline)	1,807 TPY

Notes:

CO₂e = carbon dioxide equivalent; TPY = metric tons per year

¹ Emissions were modeled using the URBEMIS 2007 (Version 9.2.4) computer model, based on trip generation rates obtained from Section 3.14 Traffic of this EIR; proposed land uses identified in Chapter 2.0, "Project Description,;" and default model assumptions where detailed information was not available. URBEMIS accounts for emissions from vehicles and natural gas use. URBEMIS output is in units of tons CO₂/year, whereas a standard unit for reporting GHG emissions is in metric tons CO₂e/year. URBEMIS does not include emission factors for CH₄ and N₂O. Tons were converted to metric tons using the factor of 0.907 metric tons per ton.

² Project indirect operational emissions for electricity generation were calculated using GHG emission factors from the California Climate Action Registry (CCAR) General Reporting Protocol, Version 3.1 January 2009, Appendix C.

³ CCAR emission factors were used to calculate GHG emissions due to water consumption.

Notes: The values presented in this table do not include the full life-cycle of GHG emissions that may occur over the production/transport of materials used during construction of the project or solid waste disposal over the life of the project, end-of-life of the materials and processes that would contribute to GHG emissions that occur as an indirect result of the project, etc. Doing so would require analysis beyond the current capabilities in impact assessment, and would lead to a false and misleading level of precision in reporting of project-related GHG emissions. Further, indirect emissions associated with in-state energy production, solid waste disposal, and wastewater treatment would be regulated under AB 32 at the source or facility that would handle these processes. The emissions associated with offsite facilities in California would be closely controlled, reported, capped, and traded under AB 32 and ARB programs. Therefore, this category of emissions would be consistent with AB 32 requirements.

Refer to Appendix D for detailed assumptions and modeling output files.

3.5.5.3 14,000 SF ALTERNATIVE

The amount of grading and type of construction activities would be reduced compared to the 18,230 sf Alternative. Construction emissions, including GHG emissions, would be reduced compared to the 18,230 sf Alternative. Operational GHG emissions generated by the 14,000 sf Alternative would be reduced compared to the 18,230 sf Alternative. As with the 18,230 sf Alternative, the future operational emissions associated with vehicle travel would not exceed the General Conformity Rule *de minimis*

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thresholds or exceed 10 percent the County's regional project emissions. Further, vehicle trips to and from the site would be reduced and less area source emissions would be generated by operation of a smaller facility. No substantial direct, indirect, or cumulative adverse effect on air quality would occur as a result of the 14,000 sf Alternative.

3.5.5.4 10,000 SF ALTERNATIVE

The amount of grading and type of construction activities would be reduced compared to the 18,230 sf Alternative. Construction emissions, including GHG emissions, would be reduced compared to the 18,230 sf Alternative. Operational GHG emissions generated by the 10,000 sf Alternative would be reduced compared to the 18,230 sf Alternative. As with the 18,230 sf Alternative, the future operational emissions associated with vehicle travel would not exceed the General Conformity Rule *de minimis* thresholds or exceed 10 percent the County's regional project emissions. Further, vehicle trips to and from the site would be reduced and less area source emissions would be generated by operation of a smaller facility. No substantial direct, indirect, or cumulative adverse effect on air quality would occur as a result of the 10,000 sf Alternative.

3.5.5.5 2,800 SF ALTERNATIVE

The amount of grading and type of construction activities would be substantially reduced compared to the 18,230 sf Alternative. Both daily and annual construction emissions, including GHG emissions, would be reduced as part of this alternative. Operational GHG emissions generated by the 2,800 sf Alternative would be increased compared to the 18,230 sf Alternative, since the building would not be designed to LEED standards. As with the 18,230 sf Alternative, the future operational emissions associated with vehicle travel would not exceed the General Conformity Rule *de minimis* thresholds or exceed 10 percent the County's regional project emissions. Further, vehicle trips to and from the site would be similar to existing conditions. No substantial direct, indirect, or cumulative adverse effect on air quality would occur as a result of the 2,800 sf Alternative.

3.5.6 MITIGATION MEASURES

No mitigation measures are required.

3.5.7 SIGNIFICANCE SUMMARY

3.5.7.1 NO ACTION ALTERNATIVE

Because no action would be taken on the project site, the No Action Alternative would have no direct, indirect, or cumulative effect on air quality.

3.5.7.2 18,230 SF ALTERNATIVE

See Section 3.5.7.5 below.

3.5.7.3 14,000 SF ALTERNATIVE

See Section 3.5.7.5 below.

3.5.7.4 10,000 SF ALTERNATIVE

See Section 3.5.7.5 below.

3.5.7.5 2,800 SF ALTERNATIVE

As stated above, construction and operations emission generated by the alternatives would not have a direct, indirect, or cumulative adverse effect on air quality.

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