4.2 Air Quality

This section addresses the potential air quality impacts associated with the emission of air pollutants during both construction and post-construction operations of buildout allowed by the Housing Element Update (HEU). Complete air quality modeling data are contained in Appendix J of this EIR, and include criteria pollutant emission data calculated using the California Emissions Estimator Model (CalEEMod) and carbon monoxide (CO) concentrations calculated using CALINE4.

4.2.1 Existing Conditions

4.2.1.1 Environmental Setting

a. Air Basin/Geographic Setting

The State of California is divided geographically into 15 air basins for the purpose of managing the air resources of the State on a regional basis. Areas within each air basin are considered to share the same air masses and, therefore, are expected to have similar ambient air quality. The City of Encinitas is located within the western portion of the San Diego Air Basin (SDAB), which encompasses the entire County of San Diego. The westerly, coastal areas of the SDAB typically experience westerly winds which direct pollutants eastward. The eastern portion of the SDAB is surrounded by mountains to the north, east and south. These mountains tend to restrict airflow and concentrate pollutants in the valleys and low-lying areas below.

Air quality is commonly expressed as the number of days per year in which air pollution levels exceed Federal standards set by the U.S. Environmental Protection Agency (U.S. EPA) or State standards set by the California Air Resources Board (CARB).

b. Climate

The City is in a coastal area adjacent to the Pacific Ocean. The City, like the rest of San Diego County's coastal areas, has a Mediterranean climate characterized by warm, dry summers and mild, wet winters. The mean annual temperature for the City is 60 degrees Fahrenheit (°F). The average annual precipitation is 11 inches, falling primarily from November to April. Winter low temperatures in the City average about 54°F, and summer high temperatures average about 71°F. The average relative humidity is 69 percent and is based on the yearly average humidity at Lindbergh Field (Western Regional Climate Center [WRCC] 2015).

The dominant meteorological feature affecting the region is the Pacific High Pressure Zone, which produces the prevailing westerly to northwesterly winds. These winds tend to blow pollutants away from the coast toward the inland areas. Consequently, air quality near the coast is generally better than that which occurs at the base of the coastal mountain range. Most of the City consists of coastal plains, which lie adjacent to the Pacific Ocean and extend inland to the base of the interior foothills. The most easterly portions of the City extend approximately 6 miles east of the Pacific Ocean. Because of its locational advantage to the coast, the westerly portion of the City has a mild climate with cool summers on the coast, where fog is common.

Fluctuations in the strength and pattern of winds from the Pacific High Pressure Zone interacting with the daily local cycle produce periodic temperature inversions that influence the dispersal or containment of air pollutants in the SDAB. Beneath the inversion layer pollutants become “trapped” as their ability to disperse diminishes. The mixing depth is the area under the inversion layer. Generally, the morning inversion layer is lower than the afternoon inversion layer. The greater the change between the morning and afternoon mixing depths, the greater the ability of the atmosphere to disperse pollutants.

Throughout the year, the height of the temperature inversion in the afternoon varies between approximately 1,500 and 2,500 feet above mean sea level (AMSL). In winter, the morning inversion layer is about 800 feet AMSL. In summer, the morning inversion layer is about 1,100 feet AMSL. Therefore, air quality generally tends to be better in the winter than in the summer.

The prevailing westerly wind pattern is sometimes interrupted by regional “Santa Ana” conditions. A Santa Ana occurs when a strong high pressure develops over the Nevada–Utah area and overcomes the prevailing westerly coastal winds, sending strong, steady, hot, dry northeasterly winds over the mountains and out to sea.

Strong Santa Anas tend to blow pollutants out over the ocean, producing clear days. However, at the onset or during breakdown of these conditions or if the Santa Ana is weak, local air quality may be adversely affected. In these cases, emissions from the South Coast Air Basin (SCAB) to the north are blown out over the ocean, and low pressure over Baja California, Mexico draws this pollutant-laden air mass southward. As the high pressure weakens, prevailing northwesterly winds reassert themselves and send this cloud of contamination ashore in the SDAB. When this event does occur, the combination of transported and locally produced contaminants produce the worst air quality measurements recorded in the basin.

4.2.1.2 Existing Air Quality

a. National and California Ambient Air Quality Standards

In order to achieve the purposes of the Federal Clean Air Act (CAA) and the California CAA, the U.S. EPA developed primary and secondary national ambient air quality standards (NAAQS) and the State developed California ambient air quality standards (CAAQS). Six criteria pollutants of primary concern have been designated: ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead (Pb) and respirable particulate matter (PM_{10} and $PM_{2.5}$). The current NAAQS and CAAQS are presented in Table 4.2-1.

Table 4.2-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		National Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone	1 Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 µg/m³)		0.070 ppm (137 µg/m³)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		–		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	12 µg/m³	15 µg/m³	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m³)	Non-dispersive Infrared Photometry	35 ppm (40 mg/m³)	–	Non-dispersive Infrared Photometry
	8 Hour	9.0 ppm (10 mg/m³)		9 ppm (10 mg/m³)	–	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)		–	–	
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m³)	Gas Phase Chemi-luminescence	100 ppb (188 µg/m³)	–	Gas Phase Chemi-luminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)		0.053 ppm (100 µg/m³)	Same as Primary Standard	
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m³)	Ultraviolet Fluorescence	75 ppb (196 µg/m³)	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3 Hour	–		–	0.5 ppm (1,300 µg/m³)	
	24 Hour	0.04 ppm (105 µg/m³)		0.14 ppm (for certain areas)	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)	–	
Lead	30 Day Average	1.5 µg/m³	Atomic Absorption	–	–	High Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m³ (for certain areas)	Same as Primary Standard	
	Rolling 3-Month Average	–		0.15 µg/m³		
Visibility Reducing Particles	8 Hour	Instrumental equivalents: -extinction of 0.23 per kilometer statewide -extinction of 0.07 per kilometer for Lake Tahoe Air Basin	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m³	Ion Chroma-tography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m³)	Gas Chroma-tography			

[1]SOURCE: State of California 2015a.
ppm = parts per million; ppb = parts per billion; µg/m³ = micrograms per cubic meter; – = not applicable.

b. Air Quality Measurements

The San Diego Air Pollution Control District (SDAPCD) maintains 10 air quality monitoring stations throughout the greater San Diego metropolitan region. Air pollutant concentrations and meteorological information are continuously recorded at these stations. Measurements are then used by scientists to help forecast daily air pollution levels.

The Del Mar–Mira Costa College monitoring station, located 3.5 miles south of the City, the Escondido—East Valley Parkway monitoring station, located 8 miles east of the City, and the Camp Pendleton monitoring station, located 10 miles north of the City, are the nearest stations to the City. The Del Mar–Mira Costa College monitoring station measures ozone. The Escondido—East Valley Parkway monitoring station measures ozone, NO_2, CO, PM_{10} and $PM_{2.5}$. The Camp Pendleton monitoring station measures ozone and NO_2. Table 4.2-2 provides a summary of measurements collected at these monitoring stations from 2010 to 2014.

Table 4.2-2
Summary of Air Quality Measurements Recorded at the Del Mar—Mira Costa College, Escondido—East Valley Parkway and Camp Pendleton Monitoring Stations

Pollutant/Standard	2010	2011	2012	2013	2014
DEL MAR—MIRA COSTA COLLEGE					
Ozone					
Days State 1-hour Standard Exceeded (0.09 ppm)	0	0	0	0	1
Days State 8-hour Standard Exceeded (0.07 ppm)	2	1	2	0	4
Days Federal 8-hour Standard Exceeded (0.075 ppm)	0	0	2	0	2
Max. 1-hr (ppm)	0.085	0.091	0.088	0.076	0.100
Max 8-hr (ppm)	0.072	0.075	0.079	0.070	0.088
ESCONDIDO—EAST VALLEY PARKWAY					
Ozone					
Days State 1-hour Standard Exceeded (0.09 ppm)	2	1	0	0	1
Days State 8-hour Standard Exceeded (0.07 ppm)	5	2	2	4	8
Days Federal 8-hour Standard Exceeded (0.075 ppm)	3	2	0	0	5
Max. 1-hr (ppm)	0.105	0.098	0.084	0.084	0.099
Max 8-hr (ppm)	0.085	0.089	0.074	0.075	0.080
Nitrogen Dioxide					
Days State 1-hour Standard Exceeded (0.18 ppm)	0	0	0	0	0
Days Federal 1-hour Standard Exceeded (0.100 ppm)	0	0	0	0	0
Max 1-hr (ppm)	0.064	0.062	0.062	0.061	0.063
Annual Average (ppm)	0.014	Na	0.013	0.013	0.011
Carbon Monoxide					
Days State 8-hour Standard Exceeded (9 ppm)	0	0	0	0	0
Days Federal 8-hour Standard Exceeded (9 ppm)	0	0	0	0	0
Max. 1-hr (ppm)	3.90	3.50	4.40	3.20	Na
Max. 8-hr (ppm)	2.46	2.30	3.70	Na	Na
PM_{10}*					
Measured Days State 24-hour Standard Exceeded (50 μg/m^3)	0	0	0	1	0
Calculated Days State 24-hour Standard Exceeded (50 μg/m^3)	0.0	0.0	0.0	6.0	0.0
Measured Days Federal 24-hour Standard Exceeded (150 μg/m^3)	0	0	0	0	0
Calculated Days Federal 24-hour Standard Exceeded (150 μg/m^3)	0.0	0.0	0.0	0.0	0.0
Max. Daily (μg/m^3)	43.0	40.0	33.0	82.0	44.0
State Annual Average (μg/m^3)	21.0	18.8	18.1	23.1	21.5
Federal Annual Average (μg/m^3)	20.9	18.8	18.0	23.2	21.6

Table 4.2-2
Summary of Air Quality Measurements Recorded at the Del Mar—Mira Costa College, Escondido—East Valley Parkway and Camp Pendleton Monitoring Stations

Pollutant/Standard	2010	2011	2012	2013	2014
ESCONDIDO—EAST VALLEY PARKWAY					
$PM_{2.5}$*					
Measured Days Federal 24-hour Standard Exceeded (35 $\mu g/m^3$)	0	0	1	1	1
Calculated Days Federal 24-hour Standard Exceeded (35 $\mu g/m^3$)	0.0	0.0	3.1	1.1	1.0
Max. Daily ($\mu g/m^3$)	52.2	27.4	70.7	56.3	77.5
State Annual Average ($\mu g/m^3$)	Na	10.4	Na	10.5	9.6
Federal Annual Average ($\mu g/m^3$)	10.5	10.4	10.5	10.7	10.5
CAMP PENDLETON					
Ozone					
Days State 1-hour Standard Exceeded (0.09 ppm)	0	0	0	0	1
Days State 8-hour Standard Exceeded (0.07 ppm)	1	2	1	0	6
Days Federal 8-hour Standard Exceeded (0.075 ppm)	1	0	1	0	1
Max. 1-hr (ppm)	0.092	0.085	0.092	0.078	0.097
Max 8-hr (ppm)	0.079	0.071	0.081	0.066	0.080
Nitrogen Dioxide					
Days State 1-hour Standard Exceeded (0.18 ppm)	0	0	0	0	0
Days Federal 1-hour Standard Exceeded (0.100 ppm)	0	0	0	0	0
Max 1-hr (ppm)	0.081	0.066	0.061	0.081	0.060
Annual Average (ppm)	0.009	Na	0.008	Na	0.007
$PM_{2.5}$*					
Measured Days Federal 24-hour Standard Exceeded (35 $\mu g/m^3$)	0	0	0	1	0
Calculated Days Federal 24-hour Standard Exceeded (35 $\mu g/m^3$)	Na	Na	0.0	1.1	Na
Max. Daily ($\mu g/m^3$)	27.3	30.7	28.0	42.3	28.0
State Annual Average ($\mu g/m^3$)	Na	Na	10.8	Na	Na
Federal Annual Average ($\mu g/m^3$)	Na	Na	10.7	8.5	Na

SOURCE: State of California 2015b.
Na = Not available.
*Calculated days value. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Ozone

Nitrogen oxides and hydrocarbons (reactive organic gases [ROGs]) are known as the chief “precursors” of ozone. These compounds react in the presence of sunlight to produce ozone. Ozone is the primary air pollution problem in the SDAB. The SDAB is classified as a Federal and State non-attainment area for ozone. Because sunlight plays such an important role in its formation, ozone pollution, or smog, is mainly a concern during the daytime in summer months.

About half of smog-forming emissions come from vehicles. More strict automobile emission controls, including more efficient automobile engines, have played a large role in the steady decrease in ozone levels in the SDAB since the late 1970s. However, not all of the ozone within the SDAB is derived from local sources. Under certain meteorological conditions, such as during Santa Ana wind events, ozone and other pollutants are transported from the Los Angeles Basin and combine with ozone formed from local sources to produce elevated ozone levels in the SDAB.

Local agencies can control neither the source nor the transport of pollutants from outside the air basin. The SDAPCD's policy, therefore, has been to control local sources to reduce locally produced emissions. Through its transportation control measures (TCMs), enhanced motor vehicle inspection and maintenance program overseen by the Bureau of Automotive Repair and the clean-fuel vehicle program overseen by CARB, continued reductions in ozone concentrations are anticipated.

Actions that have been taken in the SDAB to reduce ozone concentrations include:

- **TCMs, if vehicle travel and emissions exceed attainment demonstration levels.** TCMs are strategies that will reduce transportation-related emissions by reducing vehicle use or improving traffic flow.

- **Enhanced motor vehicle inspection and maintenance program.** The smog-check program is overseen by the Bureau of Automotive Repair. The program requires most vehicles to pass a smog test once every two years before registering in the State of California. The smog-check program monitors the amount of pollutants automobiles produce. One focus of the program is identifying "gross polluters," or vehicles that exceed two times the allowable emissions for a particular model. Regular maintenance and tune-ups, changing oil and checking tire inflation can improve gas mileage and lower air pollutant emissions. It can also reduce traffic congestion due to preventable breakdowns, further lowering emissions.

- **Clean-fuel vehicle program.** The clean-fuel vehicle program, overseen by CARB, requires the development of cleaner burning cars and clean alternative fuels by requiring the motor vehicle industry to develop new technologies to meet air quality requirements. Clean-fuel vehicles are those that meet the emissions standards set in the 1990 amendments to the CAA. Cleaner vehicles and fuels will result in continued reductions in vehicle pollutant emissions despite increases in travel.

Carbon Monoxide

The SDAB is classified as a State attainment area and as a Federal maintenance area for CO. Until 2003, no violations of the State standard for CO had been recorded in the SDAB since 1991, and no violations of the national standard had been recorded in the SDAB since 1989. The violations that took place in 2003 were likely the result of massive wildfires that occurred throughout the county. No violations of the State or Federal CO standards have occurred since 2003.

Small-scale, localized concentrations of CO above the State and national standards have the potential to occur at intersections with stagnation points such as those that occur on major highways and heavily traveled and congested roadways. Localized high concentrations of CO are referred to as "CO hot spots" and are a concern at congested intersections, where automobile engines burn fuel less efficiently and their exhaust contains more CO.

PM_{10}

PM_{10} is particulate matter with an aerodynamic diameter of 10 microns or less. Ten microns is about one-seventh of the diameter of a human hair. Particulate matter is a complex mixture of very tiny solid or liquid particles composed of chemicals, soot and dust. Sources of PM_{10} emissions in the SDAB consist mainly of urban activities, dust suspended by vehicle traffic and secondary aerosols formed by reactions in the atmosphere.

Under typical conditions (i.e., no wildfires), particles classified under the PM_{10} category are mainly emitted directly from activities that disturb the soil, including travel on roads and construction, mining, or agricultural operations. Other sources include windblown dust, salts, brake dust and tire wear (County of San Diego 1998). For several reasons hinging on the area's dry climate and coastal location, the SDAB has special difficulty in developing adequate tactics to meet present State particulate standards.

The SDAB is designated as Federal unclassified and State non-attainment for PM_{10}. The measured Federal PM_{10} standard was exceeded once in 2007 and once in 2008 in the SDAB. The 2007 exceedance occurred on October 21, 2007, at times when major wildfires were raging throughout the county. Consequently, this exceedance was likely caused by the wildfires and would be beyond the control of the SDAPCD. As such, this event is covered under the U.S. EPA's Natural Events Policy that permits, under certain circumstances, the exclusion of air quality data attributable to uncontrollable natural events (e.g., volcanic activity, wild land fires and high wind events). The 2008 exceedance did not occur during wildfires and are not covered under this policy. No exceedances of the Federal standard have occurred since 2008.

$PM_{2.5}$

Airborne, inhalable particles with aerodynamic diameters of 2.5 microns or less have been recognized as an air quality concern requiring regular monitoring. Federal $PM_{2.5}$ standards include an annual arithmetic mean of 15 $\mu g/m^3$ and a 24-hour concentration of 35 $\mu g/m^3$. State $PM_{2.5}$ standards established in 2002 are an annual arithmetic mean of 12 $\mu g/m^3$.

The SDAB was classified as an attainment area for the previous Federal 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$ and has also been classified as an attainment area for the revised Federal 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ (U.S. EPA 2004, 2009). The SDAB is a non-attainment area for the State $PM_{2.5}$ standard.

Other Criteria Pollutants

The national and State standards for NO_2, SO_x and the previous standard for lead are being met in the SDAB, and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future. The SDAB is also in attainment of the State standards for vinyl chloride, hydrogen sulfides (H_2S), sulfates and visibility reducing particulates.

4.2.2 Regulatory Framework

Motor vehicles are San Diego County's leading source of air pollution (County of San Diego 2013). In addition to these sources, other mobile sources include construction equipment, trains and airplanes. Emission standards for mobile sources are established by State and Federal agencies, such as CARB and the U.S. EPA. Reducing mobile source emissions requires the technological improvement of existing mobile sources and the examination of future mobile sources, such as those associated with new or modification projects (e.g., retrofitting older vehicles with cleaner emission technologies). The State of California has developed programs to encourage cleaner cars and cleaner fuels. The regulatory framework described below details the Federal and State agencies that are in charge of monitoring and controlling mobile source air pollutants and the measures currently being taken to achieve and maintain healthful air quality in the SDAB.

4.2.2.1 Federal

The Federal CAA was enacted in 1970 (and amended several times since) for the purpose of protecting and enhancing the quality of the nation's air resources. In 1971, in order to achieve the purposes of Section 109 of the CAA [42 United States Code 7409], the U.S. EPA developed primary and secondary NAAQS. As discussed in Section 4.2.1.2, six criteria pollutants of primary concern have been designated: O_3, CO, SO_2, NO_2, lead and respirable particulate matter (PM_{10} and $PM_{2.5}$). The current NAAQS are presented in Table 4.2-1 and represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect public health and welfare considering long-term exposure of the most sensitive groups in the general population (i.e., children, senior citizens and people with breathing difficulties). The SDAB is classified as a Federal non-attainment area for ozone.

4.2.2.2 State

a. Criteria Pollutants

The U.S. EPA allowed states the option to develop different (stricter) air quality standards. Through the California CAA signed into law in 1988, the CARB has generally set more stringent limits on the criteria pollutants as shown in Table 4.2-1. The SDAB is classified as a State non-attainment area for ozone, PM_{10} and $PM_{2.5}$.

The California CAA additionally requires that air quality management districts implement regulations to reduce emissions from mobile sources through the adoption and enforcement of transportation control measures and:

- Demonstrate the overall effectiveness of the air quality program;
- Reduce non-attainment pollutants at a rate of 5 percent per year, or include all feasible measures and expeditious adoption schedule;
- Implement public education programs;

- Reduce per-capita population exposure to severe non-attainment pollutants according to a prescribed schedule;
- Include any other feasible controls that can be implemented, or for which implementation can begin, within 10 years of adoption of the most recent air quality plan; and
- Rank control measures by cost-effectiveness and implementation priority.

b. State Implementation Plan

The State Implementation Plan (SIP) is a collection of documents that set forth the State's strategies for achieving the NAAQS. In California, the SIP is a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, State regulations and Federal controls. The CARB is the lead agency for all purposes related to the SIP under State law. Local air districts and other agencies, such as the Department of Pesticide Regulation and the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. The CARB then forwards SIP revisions to the U.S. EPA for approval and publication in the Federal Register. All of the items included in the California SIP are listed in the Code of Federal Regulations (CFR) at 40 CFR 52.220.

The SDAPCD is responsible for preparing and implementing the portion of the SIP applicable to the SDAB. The SDAPCD adopts rules, regulations and programs to attain State and Federal air quality standards and appropriates money (including permit fees) to achieve these objectives.

c. Toxic Air Contaminants

The public's exposure to toxic air contaminants (TACs) is a significant public health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (Assembly Bill [AB] 1807). Diesel-exhaust particulate matter emissions have been established as TACs. Diesel exhaust is a complex mixture of gases, vapors and fine particles.

The California Air Toxics Program establishes the process for the identification and control of TACs and includes provisions to make the public aware of significant toxic exposures and for reducing risk. Additionally, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks and to reduce those significant risks to acceptable levels. The Children's Environmental Health Protection Act (California Senate Bill 25), focuses on children's exposure to air pollutants. The act requires CARB to review its air quality standards from a children's health perspective, evaluate the statewide air monitoring network and develop any additional air toxic control measures needed to protect children's health.

Locally, toxic air pollutants are regulated through the SDAPCD's Regulation XII. Of particular concern statewide are diesel-exhaust particulate matter emissions. Diesel-exhaust particulate matter was established as a TAC in 1998, and is estimated to represent a majority of the cancer risk from TACs statewide (based on the statewide average). Following the identification of diesel particulate matter (DPM) as a TAC in 1998, CARB has worked on developing strategies and regulations aimed at reducing the risk from DPM. The overall strategy for achieving these reductions is found in the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (State of California 2000). In April 2005, CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (State of California 2005). The handbook makes recommendations directed at protecting sensitive land uses from air pollutant emissions while balancing a myriad of other land use issues (e.g., housing, transportation needs, economics, etc.). It notes that the handbook is not regulatory or binding on local agencies and recognizes that application takes a qualitative approach. As reflected in the CARB Handbook, there is currently no adopted standard for the significance of health effects from mobile sources. Therefore, the CARB has provided guidelines for the siting of land uses near heavily traveled roadways. Of pertinence to this study, the CARB guidelines indicate that siting new sensitive land uses within 500 feet of a freeway or urban roads with 100,000 or more vehicles/day should be avoided when possible. It should be noted that the relative risk varies greatly. To determine the actual risk near heavily traveled roadways, a site-specific analysis that takes into account local factors such as total traffic volumes, truck volumes, wind speed and direction, and meteorological conditions. Rather, the handbook recommendations are designed to fill a gap where area-specific information is not available.

As an ongoing process, CARB will continue to establish new programs and regulations for the control of diesel-particulate and other air-toxics emissions as appropriate. The continued development and implementation of these programs and policies will ensure that the public's exposure to DPM will continue to decline.

4.2.2.3 Local

a. San Diego Air Pollution Control District

The SDAPCD is the agency that regulates air quality in the SDAB. The SDAPCD prepared the Regional Air Quality Strategy (RAQS) in response to the requirements set forth in the CAA AB 2595 (County of San Diego 1992). Attached, as part of the RAQS, are the TCMs for the air quality plan prepared by the San Diego Association of Governments (SANDAG) in accordance with AB 2595 and adopted by SANDAG on March 27, 1992, as Resolution Number 92-49 and Addendum. The RAQS and TCM set forth the steps needed to accomplish attainment of State AAQS.

b. General Plan/Local Coastal Program

The City of Encinitas General Plan, along with relevant specific plans, contains policies directly and indirectly related to air quality. Pertinent goals and policies related to air quality are listed below in Table 4.2-3.

Table 4.2-3 Goals and Policies Related to Air Quality	
Goal/Policy	Description
City of Encinitas General Plan Land Use Element	
Goal 1	Encinitas will strive to be a unique seaside community providing a balance of housing, commercial light industrial development, recreation, agriculture and open space compatible with the predominant residential character of the community.
1.14	The City will maintain and enhance the Highway 101 commercial corridor by providing appropriate community-serving tourist-related and pedestrian-oriented uses.
1.15	Commercial and industrial uses shall be required to provide easy and safe pedestrian, bicycle and handicapped access.
City of Encinitas General Plan Circulation Element	
1.15	The City will actively support an integrated transportation program that encourages and provides for mass-transit, bicycle transportation, pedestrians, equestrians, and car-pooling.
Goal 3	The City of Encinitas will promote the use of other modes of transport to reduce the dependence on the personal automobile.
3.2	Continue to assist in expanding public transportation and emphasize public transportation in future development with preference given to cost-effective alternatives.
3.3	Create a safe and convenient circulation system for pedestrians.
3.4	Cooperate with San Diego County, SANDAG, and other jurisdictions to help plan and implement a regional multi-modal transportation system that is accessible to residents in the City.
3.5	Encourage development of mass transit and transit access points along the existing I-5 freeway corridor or along the railroad right-of-way.
3.6	The City should provide and encourage efficient links between possible rail transit service and other transportation modes, including rerouting of bus service to interface with transit stops.
3.11	The City will strive to implement a safe, direct, and convenient circulation system for commuting and recreational bicycle traffic. The City will support the development of additional bicycle facilities in the Coastal Zone, including the following: · All Circulation Element roads will include provisions for bicycle lanes unless precluded by design and safety considerations in which cases, alternative routes shall be provided to form a continuous network. · The provision of secure bicycle storage facilities at all beaches designated for high and moderate levels of use. · The installation of bicycle and surfboard racks on all buses serving the Coastal Zone.
City of Encinitas General Plan Resource Management Element	
Goal 5	The City will make every effort to participate in programs to improve air and water quality in the San Diego region.
5.1	The City will monitor and cooperate with the ongoing efforts of the U. S. Environmental Protection Agency, the San Diego Air Pollution Control District, and the State of California Air Resources Board in improving air quality in the regional air basin. The City will implement appropriate strategies from the San Diego County SIP which are consistent with the goals and policies of this plan.
Goal 13	Create a desirable, healthful, and comfortable environment for living while preserving Encinitas, unique natural resources by encouraging land use policies that will preserve the environment.

Table 4.2-3
Goals and Policies Related to Air Quality

Goal/Policy	Description
13.1	The City shall plan for types and patterns of development which minimize water pollution, air pollution, fire hazard, soil erosion, silting, slide damage, flooding and severe hillside cutting and scarring.
Goal 15	The City will make every effort to conserve energy in the City thus reducing our dependence on fossil fuels.
15.1	The City will encourage the use of alternate energy systems, including passive solar and architectural and mechanical systems, in both commercial and residential development.
15.2	The patterns of proposed subdivisions and the orientation and design of structures on lots shall be designed with the objective of maximizing the opportunities for solar energy use and energy conservation.
15.3	Energy conserving construction standards and requirements shall be enforced in the field inspection of new construction.
SOURCE: City of Encinitas 1989, amended 2014.	

4.2.3 Significance Determination Thresholds

Consistent with Appendix G of the CEQA Guidelines, impacts related to air quality would be significant if the HEU project would:

1. Obstruct the implementation or conflict with the primary goals of the RAQS;

2. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including release emissions which exceed quantitative thresholds for ozone precursors); or

3. Expose sensitive receptors to substantial pollutant concentrations.

4.2.4 Methodology

4.2.4.1 Modeling

Air emissions were calculated using CalEEMod 2013.2.2 (California Air Pollution Control Officers Association [CAPCOA] 2013). The CalEEMod program is a tool used to estimate air emissions resulting from land development projects based on California specific emission factors. The model estimates mass emissions from two basics sources: construction sources and operational sources (i.e., area, energy, and mobile sources).

Inputs to CalEEMod include such items as the air basin containing the project, land uses, trip generation rates, trip lengths, vehicle fleet mix (percentage autos, medium truck, etc.), trip distribution (i.e., percent home to work, etc.), duration of construction phases, construction equipment usage, grading areas, season and ambient temperature, as well as other parameters. Emissions of ROG, NO_x, CO, SO_x, PM_{10} and $PM_{2.5}$ are calculated.

Appendix J contains details of the parameters used to model criteria pollutant emissions and full modeling outputs.

4.2.4.2 Future Project Implementation

Redevelopment of the housing sites may occur with or without implementation of the project. The floating zone program gives a property owner a choice whether to opt into the housing plan, or forgo doing so and retain their existing zoning rights. Depending on the category of the existing zoning, different levels of development or reconstruction activities are permitted on the housing sites.

Implementation of HEU floating zone program would result in an increase in development intensity and traffic generation on the housing sites under any of the three housing strategies. The impact analysis below describes the type and magnitude of the potential environmental impacts associated with future development under the HEU floating zone program. Future development has the potential to impact air quality. The analysis in the following section identifies the significance of impacts and a mitigation framework for future projects.

Subsequent "by right" development within the new zoning district created through this program would not be subject to further CEQA review to analyze project-level impacts on air quality, unless otherwise noted. Compliance with development standards required for "by right" development as well as the mitigation framework s identified in this PEIR would serve to minimize the potential for significant impacts associated with implementation of the HEU.

4.2.5 Issue 1: Consistency with RAQS

Would the project conflict with the primary goals of the RAQS?

4.2.5.1 Impacts

As described above, the California CAA requires air basins that are designated non-attainment of State AAQS for criteria pollutants prepare and implement plans to attain the standards by the earliest practicable date. The two pollutants addressed in the San Diego RAQS are volatile organic compounds (VOC) and oxides of nitrogen (NO_x), which are precursors to the formation of ozone. The basis for the RAQS relies on information from CARB and SANDAG, including the distribution of population in the region and all other source emissions as projected by SANDAG. The SDAPCD refers to adopted general plans to forecast, inventory and allocate regional emissions from land use and development-related sources. These emissions budgets are used in statewide air quality attainment planning efforts. As such, projects that propose development that is equal to or less than population growth projections/adopted general plan assumptions and land use intensity are inherently consistent. Projects that propose development that is greater than anticipated in the growth projections warrant further analysis to determine consistency with RAQS and the SIP.

The HEU does not propose the construction of new housing or other development; rather, it provides capacity for future development consistent with State Housing Element Law.

Emissions associated with the future operations of each housing strategy and the Adopted Plan were calculated using the methodology discussed in Section 4.2.4.2. The results are summarized in Table 4.2-4.

Table 4.2-4
Total Operational Emissions
(pounds per day)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Adopted Plan						
Area Sources	86	1	92	0	2	2
Energy Sources	0	2	1	0	0	0
Mobile Sources	96	112	729	2	140	39
Total	182	116	**823**	2	**143**	41
Housing Strategy 1 (RM)						
Area Sources	88	2	159	0	3	3
Energy Sources	0	3	1	0	0	0
Mobile Sources	125	149	966	3	190	53
Total	213	154	**1,126**	3	**194**	57
Housing Strategy 2 (BYO)						
Area Sources	83	2	153	0	3	3
Energy Sources	0	3	1	0	0	0
Mobile Sources	140	167	1,080	3	214	60
Total	223	172	**1,234**	3	**217**	63
Housing Strategy 3 (MMUP)						
Area Sources	156	3	269	0	6	6
Energy Sources	1	5	3	0	0	0
Mobile Sources	149	176	1,143	3	223	62
Total	**305**	185	**1,415**	3	**229**	68
Project-Level Significance Threshold	*250*	*250*	*550*	*250*	*100*	*100*

NOTES: **Bold** numbers exceed threshold. Totals may vary due to independent rounding.
RM = Ready Made
BYO = Build Your Own
MMUP = Modified Mixed Use Places

As shown, each of the housing strategies would result in greater emissions than buildout of the adopted plan. Additionally, housing strategies 1 (RM) and 2 (BYO) would result in emissions that are greater than the thresholds for CO and PM_{10}, and housing strategy 3 (MMUP) would result in emissions that are greater than the thresholds for ROG, CO, and PM_{10}. Housing strategy 3 (MMUP) would result in the greatest emissions, followed by housing strategy 2 (BYO) and then housing strategy 1 (RM).

All three strategies encourage increased development diversity by increasing commercial and multi-family land uses. Locating different land uses types near one another can decrease vehicle miles travelled (VMT), since trips between land use types are shorter and may be accommodated by alternative modes of transportation (CAPCOA 2010). Each of the housing strategies would increase vehicle trip efficiency. Additionally, as discussed under Issue 2, total emissions due to operation of each of the modeled housing sites would be less than the applicable thresholds for all criteria pollutants (refer to Section 4.2.6.1.a). However, because the HEU would exceed the growth projections currently accounted for in the land use plan and would result in emissions that are greater than what is currently accounted for in the RAQS, impacts would be significant. Additionally, the significant air quality impacts could contribute to a pollutant for which the area is non-attainment. Therefore, this is considered to be a significant and unavoidable impact (Impact AQ-1).

4.2.5.2 Significance of Impacts

As noted earlier, the CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by cities. As such, projects that propose development that is consistent with the growth anticipated by the general plan (or less dense) would be consistent with the RAQS. If a project proposes development that is greater than what is assumed in SANDAG's growth projections upon which the RAQS is based, then the project would be in conflict with the RAQS and SIP. However, the current population and housing in the County are lower than what was projected for the region, and therefore it is unlikely that the additional units from the HEU would interfere with the SDAPCD's goals for improving air quality in the SDAB.

However, from a long-term planning standpoint, implementation of any of the housing strategies would not comply with the existing assumptions of density and land use utilized to develop the RAQS and applicable SIP. Therefore, a revised housing forecast will need to be provided to SANDAG to ensure that the next revisions to the RAQS and the SIP accurately reflect the anticipated growth. SANDAG housing forecasts are updated every four years. The next forecast is scheduled for revision in 2019.

Because the HEU would result in emissions that are greater than what is currently accounted for in the RAQS. The significant air quality impacts would contribute to a pollutant for which the area is non-attainment. Therefore, this is considered to be a significant impact (Impact AQ-1).

4.2.5.3 Mitigation Framework

The following mitigation measure will address the project's inconsistency.

AQ-1: Prior to the next update of the regional housing needs assessment within six months of the certification of the final EIR, the City shall provide a revised housing forecast to SANDAG to ensure that any revisions to the population and employment projections used by SDAPCD in updating the RAQS and the SIP will accurately reflect anticipated growth due to the HEU.

4.2.5.4 Significance After Mitigation

The provision of this information would assist SANDAG in revising the housing forecasts; however, until the anticipated growth is included in the emission estimates of the RAQS and the SIP, direct and cumulative impacts relative to conformance with the RAQS would remain significant and unavoidable. It should be noted that the SDAPCD may revise an emission reduction strategy if the district demonstrates to CARB, and CARB finds, that the modified strategy is at least as effective in improving air quality as the strategy being replaced. The last RAQS was adopted in 2009 and only accounts for the transportation and land use plans that were in place at the time of its adoption. (Refer to Chapter 7.0 for a discussion of cumulative impacts.)

4.2.6 Issue 2: Criteria Pollutants

Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including release emissions which exceed quantitative thresholds for ozone precursors)?

4.2.6.1 Impacts

a. Housing Sites

Air quality impacts can result from the construction and operation activities. Construction impacts are temporary and result from fugitive dust, equipment exhaust and indirect effects associated with construction workers and deliveries. Operational impacts can occur on two levels: regional impacts resulting from development or local effects stemming from sensitive receivers being placed close to roadways or stationary sources. In the case of the project, operational impacts are primarily due to emissions from mobile sources associated with the vehicular travel along the roadways.

Construction Emissions

The HEU does not propose the construction of new housing or other development; rather, it provides capacity for future development consistent with State Housing Element Law. To determine the potential air quality impacts associated with future construction of housing sites, emissions due to construction of the housing sites with the most development potential under the HEU were modeled using CalEEMod. Housing site ALT-7 is the largest (21.02 acres) and proposes the greatest amount of commercial and residential development. As such, housing site ALT-7 would result in the greatest amount of construction-related emissions. Ten of the other largest housing sites were selected for modeling based on size of the housing site and amount of proposed development (ALT-2, NE-4, ALT-3, OE-5, ALT-5, OE-8, C-2, NE-3, C-1 and NE-1). In order to evaluate the range of emissions from all of the housing sites, emissions due to construction of the two smallest housing sites, both in acreage and development, were also modeled (CBHMG-1 and C-7). Emissions were modeled using the parameters and assumptions discussion in Appendix J. The results are summarized in Table 4.2-5.

Table 4.2-5
Summary of Worst-case Construction Emissions
(pounds per day)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
ALT-7						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	6	42	55	0	7	3
Paving	2	20	15	0	1	1
Architectural Coatings	705	3	5	0	1	0
Maximum Daily Emissions	**705**	75	55	0	21	13
ALT-2						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	6	38	44	0	5	3
Paving	2	20	15	0	1	1
Architectural Coatings	486	2	4	0	1	0
Maximum Daily Emissions	**486**	75	50	0	21	13
NE-4						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	5	37	43	0	5	3
Paving	2	20	15	0	1	1
Architectural Coatings	477	2	4	0	1	0
Maximum Daily Emissions	**477**	75	50	0	21	13
ALT-3						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	5	36	40	0	5	3
Paving	2	20	15	0	1	1
Architectural Coatings	419	2	4	0	1	0
Maximum Daily Emissions	**419**	75	50	0	21	13
OE-5						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	5	35	37	0	4	3
Paving	2	20	15	0	1	1
Architectural Coatings	358	2	4	0	0	0
Maximum Daily Emissions	**358**	75	50	0	21	13
ALT-5						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	5	33	34	0	4	3
Paving	2	20	15	0	1	1
Architectural Coatings	318	2	4	0	1	0
Maximum Daily Emissions	**318**	75	50	0	21	13
OE-8						
Site Preparation	5	1	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	5	34	35	0	4	2
Paving	2	20	15	0	1	1
Architectural Coatings	315	2	4	0	1	0
Maximum Daily Emissions	**315**	75	50	0	21	13

Table 4.2-5
Summary of Worst-case Construction Emissions
(pounds per day)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
C-2						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	5	33	34	0	4	2
Paving	2	20	15	0	1	1
Architectural Coatings	298	2	4	0	1	0
Maximum Daily Emissions	**298**	75	50	0	21	13
NE-3						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	5	33	33	0	4	2
Paving	2	22	15	0	1	1
Architectural Coatings	282	2	4	0	1	0
Maximum Daily Emissions	**282**	75	50	0	21	13
C-1						
Site Preparation	5	55	42	0	21	13
Grading	4	39	27	0	9	5
Building Construction	5	33	32	0	4	2
Paving	2	22	15	0	1	1
Architectural Coatings	264	2	2	0	0	0
Maximum Daily Emissions	**264**	55	42	0	21	13
NE-1						
Site Preparation	5	55	42	0	21	13
Grading	7	75	50	0	12	7
Building Construction	4	33	31	0	4	2
Paving	2	20	15	0	1	1
Architectural Coatings	242	2	3	0	0	0
Maximum Daily Emissions	242	75	50	0	21	13
CBHMG-1						
Site Preparation	1	14	8	0	1	1
Grading	1	11	9	0	2	1
Building Construction	1	14	9	0	1	1
Paving	1	11	8	0	1	1
Architectural Coatings	87	2	2	0	0	0
Maximum Daily Emissions	87	14	9	0	2	1
C-7						
Site Preparation	1	14	8	0	1	1
Grading	1	11	9	0	2	1
Building Construction	1	14	9	0	1	1
Paving	1	11	8	0	1	1
Architectural Coatings	75	2	2	0	0	0
Maximum Daily Emissions	75	14	9	0	2	1
Significance Threshold	*250*	*250*	*550*	*250*	*100*	*100*

NOTES: Modeled housing sites are shown in this table in order of greatest emissions to least emissions.
Bold numbers exceed threshold.

As shown, emissions of ROG would exceed the significance threshold of 250 pounds per day for the following ten housing sites: ALT-7, ALT-2, NE-4, ALT-3, OE-5, ALT-5, OE-8, C2, NE-3 and C-1 (Impact AQ-2). These emissions would be due to the VOC content of the architectural coatings. The modeled VOC content of 150 grams per liter was used in accordance with SDAPCD Rule 67.0. Therefore, emissions of VOC could be reduced by extending the length of the architectural coatings phase of construction and/or by requiring the use of low-VOC coatings. Since there are unknowns at this plan level with regard to phasing, length of construction and VOC content of the coatings (Impact AQ-2), emissions of ROG would be potentially significant for the ten identified housing sites. Emissions of all other criteria pollutants would be less than significant.

As also shown, for construction of housing site NE-1, emissions of all criteria pollutants including ROG would be less than the applicable thresholds. With the exception of the ten large housing sites identified above, all other housing sites are smaller, both in acreage and development intensity, than housing site NE-1. It can therefore be concluded that emissions due to construction of all other housing sites would be less than the emissions due to construction of housing site NE-1. Thus, construction emissions for the remaining housing sites would be less than significant.

Operational Emissions

To determine the potential air quality impacts associated with operation, emissions due to future operation of the housing sites that propose the greatest amount of development and would result in the greatest amount of average daily traffic were modeled using CalEEMod. As identified, housing site ALT-7 proposes the greatest amount of commercial and residential development and would generate the most traffic. As such, housing site ALT-7 would result in the greatest amount of operational-related emissions. Emissions due to operation of the ten previously identified largest housing sites were also modeled (ALT-2, NE-4, ALT-3, OE-5, ALT-5, OE-8, C-2, NE-3, C-1 and NE-1). Additionally, in order to evaluate the range of emissions from all of the housing sites, emissions due to operation of the two smallest housing sites, both in trip generation and development, were also modeled (CBHMG-1 and C-7). Emissions were modeled using the parameters and assumptions discussion in Appendix J. The results are summarized in Table 4.2-6.

Table 4.2-6
Summary of Project Operational Emissions
(pounds per day)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
ALT-7						
Area Sources	27	0	35	0	1	1
Energy Sources	0	1	0	0	0	0
Mobile Sources	58	77	437	1	57	16
Total	85	78	472	1	58	17
NE-4						
Area Sources	16	0	31	0	1	1
Energy Sources	0	1	0	0	0	0
Mobile Sources	41	55	311	1	42	12
Total	57	56	343	1	42	12

Table 4.2-6
Summary of Project Operational Emissions
(pounds per day)

	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
OE-8						
Area Sources	11	0	18	0	0	0
Energy Sources	0	0	0	0	0	0
Mobile Sources	43	57	322	1	43	12
Total	53	57	340	1	43	12
OE-5						
Area Sources	12	0	20	0	0	0
Energy Sources	0	0	0	0	0	0
Mobile Sources	42	55	314	1	42	12
Total	54	56	334	1	42	12
ALT-2						
Area Sources	18	0	26	0	1	1
Energy Sources	0	1	0	0	0	0
Mobile Sources	37	48	276	1	36	10
Total	55	49	302	1	37	11
ALT-3						
Area Sources	16	0	24	0	1	1
Energy Sources	0	1	0	0	0	0
Mobile Sources	28	37	209	0	28	8
Total	43	38	234	0	28	8
NE-1						
Area Sources	8	0	16	0	0	0
Energy Sources	0	0	0	0	0	0
Mobile Sources	27	36	204	0	27	8
Total	35	37	220	0	28	8
C-1						
Area Sources	9	0	16	0	0	0
Energy Sources	0	0	0	0	0	0
Mobile Sources	17	22	127	0	17	5
Total	26	23	143	0	17	5
C-2						
Area Sources	10	0	26	0	1	1
Energy Sources	0	0	0	0	0	0
Mobile Sources	5	8	42	0	7	2
Total	15	9	69	0	8	3
NE-3						
Area Sources	9	0	25	0	1	1
Energy Sources	0	0	0	0	0	0
Mobile Sources	5	8	40	0	7	2
Total	14	8	65	0	7	2
ALT-5						
Area Sources	10	0	28	0	1	1
Energy Sources	0	0	0	0	0	0
Mobile Sources	2	4	21	0	3	1
Total	13	5	50	0	4	2

Table 4.2-6 Summary of Project Operational Emissions (pounds per day)						
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
C-7						
Area Sources	1	0	1	0	0	0
Energy Sources	0	0	0	0	0	0
Mobile Sources	3	3	20	0	3	1
Total	3	3	21	0	3	1
CBHMG-1						
Area Sources	1	0	2	0	0	0
Energy Sources	0	0	0	0	0	0
Mobile Sources	0	0	1	0	0	0
Total	1	0	3	0	0	0
Significance Threshold	*250*	*250*	*550*	*250*	*100*	*100*
NOTES: Totals may vary due to independent rounding. Modeled housing sites are shown in this table in order of greatest emissions to least emissions.						

As shown, total emissions due to operation of each of the modeled housing sites would be less than the applicable thresholds for all criteria pollutants. The housing sites that were not modeled proposed less development and would generate less traffic than the largest modeled housing sites shown in Table 4.2-6. As such, emissions due to operation of the remaining housing sites would also be less than the applicable thresholds for all criteria pollutants. Thus, operational emissions would be less than significant.

b. Housing Strategy Summaries

Housing Strategy 1 – Ready Made (RM)

Under housing strategy 1 (RM), housing site NE-4 would generate the most construction- and operation-related emissions. Operational emissions associated with all housing sites would be less than significant.

As shown in Table 4.2-5, construction of housing site NE-4 would result in emissions of ROG that exceed the significance threshold of 250 pounds per day, and construction emissions would be potentially significant. Housing sites OE-5 and C-2 would also result in potentially significant construction emissions (Impact AQ-2). For all other housing sites under housing strategy 1, construction emissions would be less than significant.

Housing Strategy 2 – Build Your Own (BYO)

Under housing strategy 2 (BYO), housing site OE-8 would generate the most construction- and operation-related emissions. Operational emissions associated with all housing sites would be less than significant.

As shown in Table 4.2-5, construction of housing site OE-8 would result in emissions of ROG that exceed the significance threshold of 250 pounds per day, and construction emissions would be potentially significant. Housing sites C-2 and NE-3 would also result in potentially significant construction emissions (Impact AQ-2). For all other housing sites under housing strategy 2 (BYO), construction emissions would be less than significant.

Housing Strategy 3 – Modified Mixed Use Places (MMUP)

Under housing strategy 3 (MMUP), housing site ALT-7 would generate the most construction- and operation-related emissions. Operational emissions associated with all housing sites would be less than significant.

As shown in Table 4.2-5, construction of housing site ALT-7 would result in emissions of ROG that exceed the significance threshold of 250 pounds per day, and construction emissions would be potentially significant. Housing sites ALT-2, ALT-3, ALT-5, C-2, C-1 and NE-1 would also result in potentially significant construction emissions (Impact **AQ-2**). For all other housing sites under housing strategy 3 (MMUP), construction emissions would be less than significant.

4.2.6.2 Significance of Impacts

Operational emissions associated with all housing sites would be less than significant.

As shown in Table 4.2-5, construction of the following 11 housing sites would result in emissions of ROG that exceed the significance threshold of 250 pounds per day: ALT-7, ALT-2, NE-4, ALT-3, OE-5, ALT-5, OE-8, C-2, NE-3, C-1 and NE-1 (Impact AQ-2). For all other housing sites, construction emissions would be less than significant.

4.2.6.3 Mitigation Framework

AQ-2: For future development of housing sites consistent with the HEU floating zone program, wherein the City has determined a potential for ROG emissions impacts could occur, the Planning and Building Department shall require that the construction contractor be limited to the use of architectural coating (paint and primer) products that have a low- to no-VOC rating.

4.2.6.4 Significance After Mitigation

Impacts related to criteria pollutants within housing strategies 1 (RM), 2 (BYO), and 3 (MMUP) (Impact AQ-2) would be mitigated through the application of measure AQ-2**.**

4.2.7 Issue 3: Sensitive Receptors

Would the project expose sensitive receptors to substantial pollutant concentrations?

4.2.7.1 Impacts

a. Housing Sites

Diesel Particulate Matter

Diesel-fired particulate matter has been identified as a TAC. The health risks associated with diesel particulate matter are those related to long-term exposures (i.e., cancer and chronic effects). Long-term health risk effects are generally evaluated for an exposure period of 70 years (i.e., lifetime exposure). Studies indicate that residing near sources of traffic pollution is associated with adverse health effects such as exacerbation of asthma, onset childhood asthma, non-asthma respiratory symptoms, impaired lung function, reduced lung development, and cardiovascular mortality. Because of the association between traffic pollution and health, caution should be taken when siting sensitive land uses near unhealthy traffic emissions.

CARB guidelines indicate that siting new sensitive land uses within 500 feet of a freeway or urban roads with 100,000 or more vehicles/day should be avoided when possible. Based on this guidance, Interstate 5 (I-5) is a roadway of concern. As noted earlier, actual air emissions, concentration levels, and relative risk are more nuanced and varied. To determine the actual risk near heavily traveled roadways, a site-specific analysis that takes into account local factors such as total traffic volumes, truck volumes, wind speed and direction, and meteorological conditions. At the program-level, the 500-foot buffer distance is used as guidance for determining where a site-specific analysis would be required and project design measures that reduce risk be implemented. The distance of buildings from a highway is the most readily identifiable and understandable approach for preventing the residual health risk from traffic pollution exposures for those living closest to the roadways, because as distance increases from the highway, pollution concentrations decrease (CARB 2012).

Where maintaining the recommended distance is infeasible, project design measures would be necessary to reduce and minimize health impacts on sensitive receptors. However, further analysis would need to occur to determine feasible design measures should the sites be located within 500 feet of I-5. Consideration should be given to extending this minimum buffer zone based on site-specific conditions, given the fact that unhealthy traffic emissions are often at greater distances. CARB recommended measures include high-efficiency filtration with mechanical ventilation, high-efficiency portable air cleaning devices and reducing indoor-generated pollutants. For sensitive receptors placed within 500 feet of I-5, impacts associated with diesel particulate matter exposure would be potentially significant.

The HEU does not propose the construction of new housing or other development; rather, it provides capacity for future development consistent with State Housing Element Law. A majority of the housing sites are located more than 500 feet from I-5, and impacts associated with exposure to diesel particulate matter would be less than significant. However, the following five housing sites are located within 500 feet from I-5: C-1, CBHMG-1, OE-2, L-4 and L-5. Impacts associated with diesel particulate matter exposure would be potentially significant (Impact AQ-3).

Carbon Monoxide Hot Spots

Any source that burns fuels such as combustion engines, cars, trucks, construction, farming equipment, and residential heaters and stoves is a source of CO. Because CO is a temporary atmospheric pollutant, screening level sizes for risk and hazard impacts are best studied where there are expected concentrations. As it relates to the HEU, the greatest potential risk or concern for CO violations are from vehicles that are idling at congested intersections. Localized CO concentration is a direct function of motor vehicle activity at signalized intersections (e.g., idling time and traffic flow conditions), particularly during peak commute hours and meteorological conditions. CO hot spots were assessed under buildout of housing strategy 3 (MMUP) because it would generate the greatest amount of traffic. If the inputs for traffic volumes for each roadway segment and operational conditions for the intersections in other housing strategies would have exceeded these thresholds, then they would have been utilized for the study. As detailed in subsection (b), maximum CO concentrations are not anticipated to exceed Federal and State standards for all three housing strategies. Thus, impacts associated with CO hot spots would be less than significant for all housing sites.

b. Housing Strategy Summaries

Housing Strategy 1 – Ready Made

Diesel Particulate Matter

As discussed above, a majority of the housing sites are located more than 500 feet from I-5, and impacts associated with exposure to diesel particulate matter would be less than significant. However, the following two housing sites associated with housing strategy 1 (RM) are located within 500 feet from I-5: L-4 and L-5. Impacts associated with diesel particulate matter exposure would be potentially significant (Impact AQ-3).

Carbon Monoxide Hot Spots

Housing strategy 1 (RM) would generate less traffic than housing strategy 3 (MMUP). CO hot spots associated with housing strategy 3 (MMUP) are discussed below. As shown, maximum CO concentrations are not anticipated to exceed Federal and State standards. Thus, impacts associated with CO hot spots would be less than significant.

Housing Strategy 2 – Build Your Own

Diesel Particulate Matter

A majority of the housing sites are located more than 500 feet from I-5, and impacts associated with exposure to diesel particulate matter would be less than significant. However, the following housing site associated with housing strategy 2 (BYO) is located within 500 feet from

I-5: OE-2. Impacts associated with diesel particulate matter exposure would be potentially significant (Impact AQ-3).

Carbon Monoxide Hot Spots

Housing strategy 2 (BYO) would generate less traffic than housing strategy 3 (MMUP). CO hot spots associated with housing strategy 3 (MMUP) are discussed below. As shown, maximum CO concentrations are not anticipated to exceed Federal and State standards. Thus, impacts associated with CO hot spots would be less than significant.

Housing Strategy 3 – Modified Mixed Use Places

Diesel Particulate Matter

A majority of the housing sites are located more than 500 feet from I-5, and impacts associated with exposure to diesel particulate matter would be less than significant. However, the following two housing sites associated with housing strategy 3 (MMUP) are located within 500 feet from I-5: C-1 and CBHMG-1. Impacts associated with diesel particulate matter exposure would be potentially significant (Impact AQ-3).

Carbon Monoxide Hot Spots

The SDAB is a CO maintenance area under the federal CAA. This means that SDAB was previously a non-attainment area and is currently implementing a 10-year plan for continuing to meet and maintain air quality standards. As a result, ambient CO levels have declined significantly. According to the CO Protocol, in maintenance areas, only projects that are likely to worsen air quality necessitate further analysis. The CO Protocol indicates projects may worsen air quality if they worsen traffic flow, defined as increasing average delay at signalized intersections operating at level of service (LOS) E or F or causing an intersection that would operate at LOS D or better without the project, to operate at LOS E or F. Further, according to the County of San Diego, hot spots have been found to occur only at signalized intersections that operate at or below LOS E with peak-hour trips for that intersection exceeding 3,000 trips.

Given the association between traffic pollution and health, screening level sizes for risk and hazard impacts are best be studied where traffic is greatest. The traffic study that was completed for this project concluded that 14 intersections in the City would operate at LOS E or worse under the worst-case scenario – housing strategy 3 (MMUP). Eight of the 14 intersections are unsignalized and were not considered in this analysis.

Unsignalized intersections are not evaluated as they are typically signalized as volumes increase and delays increase, and traffic volumes at unsignalized intersections are typically much lower than at signalized intersections. Based on the CO Protocol, the three worst signalized intersections were selected for a detailed CO hot spot analysis. The worst-case intersections associated with this section’s analysis are based on traffic volumes for each roadway segment and other operational conditions. These intersections provide adequate screening criteria for risk and hazard impacts since they are locations where expected concentrations of CO are highest. These intersections are listed in Table 4.2-7. CALINE4, a computer air emission dispersion model, was used to calculate CO concentrations at receivers located at each intersection.

Table 4.2-7 Maximum Buildout CO Concentrations				
Intersection	1-Hour CO ppm	1-Hour CO Standard CAAQS/NAAQS	8-Hour CO ppm[1]	8-Hour CO Standard CAAQS/ NAAQS
El Camino Real and La Costa Avenue[2]	6.6	20/35	4.6	9.0/9
El Camino Real and Leucadia Boulevard	6.4		4.5	
El Camino Real and Encinitas Boulevard	6.4		4.5	

[1]8-hour concentrations developed based on a 0.7 persistence factor.
[2]This intersection is located outside the City. The traffic study includes a study area that extends just beyond City boundaries to assess potential impacts associated with the HEU.

As shown, the maximum 1-hour concentration would be 6.6 ppm. This concentration is below the Federal and State 1-hour standards. In order to determine the 8-hour concentration, the 1-hour value was multiplied by a persistence factor of 0.7, as recommended in the CO Protocol. Based on this calculation, the maximum 8-hour concentration would be 4.6 ppm. Thus, increases of CO due to the project would be below the Federal and State 8-hour standards. Therefore, there would be no harmful concentrations of CO within the project area, and localized air quality emissions would be less than significant.

4.2.7.2 Significance of Impacts

a. Diesel Particulate Matter

A majority of the housing sites are located more than 500 feet from I-5, and impacts associated with exposure to diesel particulate matter would be less than significant. However, the following five housing sites are located within 500 feet from I-5: C-1, CBHMG-1, OE-2, L-4 and L-5. Impacts associated with diesel particulate matter exposure would be potentially significant (Impact AQ-3).

b. Carbon Monoxide Hot Spots

The CO hot spot analysis only evaluated three intersections because of the propensity of these intersections to represent the worst-case scenario for hazards and impacts. The hot spot analysis indicated that the increases of CO due to the implementation of any of the three housing strategies would be below the Federal and State 1-hour and 8-hour standards. For conducting the analysis, the land use buildout assumptions for housing strategy 3 (MMUP) was utilized because it contributes the highest level of new growth to these intersections. Housing strategy 3 (MMUP) was below the Federal and State standards. Housing strategies 1 (RM) and 2 (BYO) would generate less traffic than housing strategy 3 (MMUP), thus CO concentrations at intersections would be less than those evaluated. Therefore, the adoption and implementation of the HEU would not result in the exposure of people working or residing in the area to harmful concentrations of CO and impact to localized air quality from CO, emissions would be less than significant.

4.2.7.3 Mitigation Framework

AQ-3: In order to reduce impacts associated with exposure to diesel particulate matter, the following mitigation is recommended.

- Future development under with the HEU floating zone program shall be designed to minimize exposure to roadway-related pollutants and exposure shall be mitigated to the maximum extent feasible. Design features may include but are not be limited to: maximizing the distance between the roadway and sensitive receptors; locating air intake at the non-roadway facing sides of buildings, and ensuring that windows nearest to the roadway do not open. The orientation and placement of outdoor facilities designed for moderate physical activity shall be placed as far from the emission source as possible. Mitigation may also include installing mechanical ventilation systems with fresh air filtration and constructing a physical barrier between the roadway source and receptors of pollutants (e.g., sound wall or vegetative planting).

- New parks with athletic fields, courts, and other outdoor facilities designed for moderate to vigorous activity under the HEU floating zone program should be sited at least 500 feet from the freeway. Exceptions to this recommended practice should be made only upon a written finding from a decision-making body that the benefits of such development outweigh the public health risks or that a site-specific analysis demonstrates a less than significant risk.

- Ventilation Systems: Ventilation systems that are rated at Minimum Efficiency Reporting Value of “MERV13” or better for enhanced particulate removal efficiency shall be provided on all residential units within the HEU floating zone, located within 500 feet of I-5.

- City staff shall ensure that the aforementioned requirements are included on plans associated with any permit for future development consistent with the HEU floating zone program and submitted for approval. The City shall verify compliance on-site prior to occupancy clearance. Staff shall also review the future Covenants, Conditions and Restrictions for inclusion of guidelines pertaining to the proper maintenance/replacement of filters.

4.2.7.4 Significance After Mitigation

Diesel Particulate Matter

Impacts associated with exposure to diesel particulate within housing strategies 1 (RM), 2 (BYO), and 3 (MMUP) (Impact AQ-3) would be mitigated below a level of significance through the application of measure AQ-3.