HELIX Environmental Planning

Shady View Residential Project

Air Quality and Greenhouse Gas Emissions Technical Report

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
amsl	above mean sea level
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
C_2F_6	hexafluoroethane
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CALGreen	California Green Building Standards Code
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CF_4	tetraflouromethane
CFC	chlorofluorocarbon
CH_4	methane
City	City of Chino Hills
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DPM	diesel particulate matter
EO	Executive Order
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
I-	Interstate
IPCC	Intergovernmental Panel on Climate Change
kW	kilowatts
kWhr	kilowatt-hours
LCFS	Low Carbon Fuel Standard
LLG	Linscott, Law & Greenspan, Engineers
LOS	Level of Service
LST	localized significance threshold

ACRONYMS AND ABBREVIATIONS (cont.)

mg/m^3	milligrams per cubic meter
MMT	million metric tons
mpg	miles per gallon
mph	miles per hour
MT	metric tons
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NHTSA	National Highway Traffic Safety Administration
NO	nitrogen oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
O_3	ozone
Pb	lead
PFC	perfluorocarbon
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
ROG	reactive organic gas
RTP	Regional Transportation Plan
SB	Senate Bill
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SF	square feet
SF_6	hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
SRA	source receptor area
TACs	toxic air contaminants
TIA	Traffic Impact Analysis
USEPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled
VOC	volatile organic compound

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EXECUTIVE SUMMARY

This report presents an assessment of potential air quality and greenhouse gas (GHG) emissions impacts during construction and operation of the proposed Shady View Residential Project (project), located in the City of Chino Hills (City). The project includes construction of 159 single-family residential homes, a community recreation center, private interior streets, debris basins, utility infrastructure, and other associated improvements.

The proposed project is designed to be consistent with the City of Chino Hills General Plan and Chino Hills zoning code. The existing General Plan land use designation is split between two residential land uses, Agriculture Ranch and Low Density Residential. In addition, the zoning for the property is split between two residential zoning districts, R-S Low Density Residential and R-A Agriculture/Ranches. The location of the split occurs at the same location for both land use and zoning. As proposed, all residential development would occur in the Low-Density Residential land use designated, R-S zoned portion of the site. As such, the project's growth is accounted for in the South Coast Air Quality Management District's (SCAQMD's) Air Quality Management Plan (AQMP). Therefore, the proposed project would not conflict with or obstruct implementation of the most recent AQMP.

The project would result in emissions of criteria air pollutants during construction and operation. In accordance with SCAQMD Rule 403, fugitive dust control measures are incorporated into the project design including the use of an on-site water truck to wet down active grading areas and roads at least twice daily, maintaining a minimum moisture content of 12 percent on unpaved roads, and enforcing a 15-mile per hour (mph) speed limit on unpaved roads. Project emissions of criteria pollutants during construction would result in potentially significant impacts related to emissions of nitrogen oxides before mitigation. Mitigation measure AQ-1 would require U.S. Environmental Protection Agency (USEPA) Tier IV certified engines for all diesel construction equipment with 50 or more horsepower. Impacts related to cumulatively considerable net increases of criteria pollutant in the region would be less than significant with mitigation incorporated.

Project-generated traffic would not result in a carbon monoxide hot spot. Construction and operation of the project would not result in exposure of sensitive receptors to substantial localized criteria pollutant and precursor concentrations. Impacts related to exposure of sensitive receptors to substantial pollutant concentrations, or other emissions such as odors, would be less than significant.

With implementation of mitigation measure AQ-1, emissions of construction period diesel particulate matter (DPM) would not result in exceedances of the SCAQMD thresholds for residential incremental cancer risk or non-cancer chronic hazard. Impacts related to exposure of sensitive receptors to substantial DPM concentrations would be less than significant with mitigation.

The project would be required to comply with the 2019 Title 24 Energy Code or as amended by the state, including the requirement for on-site solar electricity generation; the 2019 California Green Building Standards Code or as amended by the state; the Assembly Bill 341 solid waste diversion target of 75 percent; reduction of potable water use by 20 percent when compared to the statewide average; low-flow water and bathroom fixtures; reduction of wastewater generation by 20 percent; weather-based irrigation systems; and provide areas for storage and collection of recyclables and yard waste. The project-related construction activities are estimated to generate 1,878 metric tons (MT) of carbon dioxide equivalent (CO_2e), or 63 MT per year of CO_2e emissions per year when amortized over 30 years. The project related operational and amortized construction GHG emissions for the first full year of

operation (estimated to be 2025) would be 2,891 MT CO_2e per year. Project emissions would not exceed the SCAQMD GHG threshold of 3,000 MT CO_2e per year. Impacts related to GHG emissions and conflicts with GHG reduction plans and policies would be less than significant.

1.0 INTRODUCTION

This report presents an assessment of potential air quality and greenhouse gas (GHG) emissions impacts during construction and operation of the proposed Shady View Residential Project (project).

1.1 PROJECT LOCATION

The project site (Assessor's Parcel Number [APN] 1057-261-06) is approximately 130 acres and is in the southeastern portion of the City of Chino Hills (City), at the southern termini of Shady View Drive and Via La Cresta, south of the existing Butterfield Ranch residential development. The project site is roughly rectangular, with a square cut-out parcel in the northeast portion of the site that is not part of the project site. The project site is located east of Chino Hills State Park, and west of State Route 71 (SR 71). The City's corporate boundary and the San Bernardino County/Riverside County boundary are adjacent to the east of the project site. See Figure 1, *Regional Location*, and Figure 2, *Aerial Photograph*.

1.2 PROJECT DESCRIPTION

The project proposes the development of a single-family residential subdivision. The proposed subdivision would consist of 159 single-family residential homes, a community recreation center, private interior streets, debris basins, utility infrastructure, and other associated improvements. Additionally, the project includes approximately 72 acres of homeowners' association-maintained open space. Site work and grading is expected to occur west of the proposed residential development to allow for stabilization of the existing earthquake fault and relocation of existing oil storage tanks and existing oil transmission lines. The relocated aboveground oil storage tanks are proposed in the northwestern portion of the project site on a 1.27-acre lot, near the western project boundary and west of the proposed residential structures. The relocated pipelines would connect the new tanks with oil facilities to the west of the project site, See Figure 3, *Site Plan*.

1.3 CONSTRUCTION ACTIVITIES AND PHASING

Project construction is assumed to occur over an approximately two-year period starting in September 2022. Construction activities include grading, installation of underground utilities and infrastructure, paving, construction of residences, and architectural coating (e.g., painting). In addition, the three existing tanks will be removed and replaced with three new smaller tanks in the northwest portion of the project. Site preparation (e.g., grubbing) would be included in the grading. Earthwork during grading includes the balanced cut and fill of approximately 2.1 million cubic yards of soil. No fill will be imported or exported, but up to 19,000 cubic yards of petroleum contaminated soil may need to be exported. All phases are assumed to occur sequentially. Detailed construction phasing and equipment assumptions are summarized in Section 4.1, *Methodology*, and provided in Appendix A.

Project construction would be required to implement all applicable fugitive dust best available control measures specified in Table 1 of the SCAQMD Rule 403, *Fugitive Dust* (SCAQMD 2005), including, but not limited to: the use of an on-site water truck to wet down exposed areas at least twice daily, maintaining a 12 percent moisture content to unpaved roads, and limiting vehicle speeds to 15 miles per hour (mph).

2.0 REGULATORY SETTING

2.1 AIR QUALITY

The project site is located within the South Coast Air Basin (SCAB). Air quality in the SCAB is regulated by the U.S. Environmental Protection Agency (USEPA) at the federal level, by the California Air Resources Board (CARB) at the state level, and by the SCAQMD at the regional level.

2.1.1 Air Pollutants of Concern

2.1.1.1 Criteria Pollutants

Criteria pollutants are defined by state and federal law as a risk to the health and welfare of the general public. In general, criteria air pollutants include the following compounds:

- Ozone (O_3)
- Carbon monoxide (CO)
- Nitrogen dioxide (NO_2)
- Particulate matter (PM), which is further subdivided:
    - Coarse PM, 10 microns or less in diameter (PM_{10})
    - Fine PM, 2.5 microns or less in diameter ($PM_{2.5}$)
- Sulfur dioxide (SO_2)
- Lead (Pb)

Criteria pollutants can be emitted directly from sources (primary pollutants, e.g., CO, SO_2, PM_{10}, $PM_{2.5}$, and lead), or they may be formed through chemical and photochemical reactions of precursor pollutants in the atmosphere (secondary pollutants; e.g., ozone, NO_2, PM_{10}, and $PM_{2.5}$). PM_{10} and $PM_{2.5}$ can be both primary and secondary pollutants. The principal precursor pollutants of concern are reactive organic gases ([ROGs] also known as volatile organic compounds [VOCs])[1] and nitrogen oxides (NO_X).

The descriptions of sources and general health effects for each of the criteria air pollutants are shown in Table 1, *Summary of Common Sources and Human Health Effects of Criteria Air Pollutants*, based on information provided by the California Air Pollution Control Officers Association ([CAPCOA] 2021a). Specific adverse health effects on individuals or population groups induced by criteria pollutant emissions are highly dependent on a multitude of interconnected variables such as cumulative concentrations, local meteorology and atmospheric conditions, and the number and characteristics of exposed individuals (e.g., age, gender). Criteria pollutant precursors (ROG and NO_X) affect air quality on a regional scale, typically after significant delay and distance from the pollutant source emissions. Health effects related to ozone and NO_2 are, therefore, the product of emissions generated by numerous sources throughout a region. Emissions of criteria pollutants from vehicles traveling to or from the project site (mobile emissions) are distributed nonuniformly in location and time throughout the region,

[1] CARB defines and uses the term ROGs while the USEPA defines and uses the term VOCs. The compounds included in the lists of ROGs and VOCs and the methods of calculation are slightly different. However, for the purposes of estimating criteria pollutant precursor emissions, the two terms are often used interchangeably.

wherever the vehicles may travel. As such, specific health effects from these criteria pollutant emissions cannot be meaningfully correlated to the incremental contribution from the project.

Table 1
SUMMARY OF COMMON SOURCES AND HUMAN HEALTH EFFECTS OF CRITERIA AIR POLLUTANTS

Pollutant	Major Man-Made Sources	Human Health Effects
Carbon Monoxide (CO)	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO_2)	A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include motor vehicles, electric utilities, and other sources that burn fuel.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Contributes to climate change and nutrient overloading, which deteriorates water quality. Causes brown discoloration of the atmosphere.
Ozone (O_3)	Formed by a chemical reaction between reactive organic gases (ROGs) and nitrogen oxides (NO_X) in the presence of sunlight. Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, gasoline storage and transport, solvents, paints, and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. Damages rubber, some textiles and dyes.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Produced by power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles, and other sources.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Sulfur Dioxide (SO_2)	A colorless, nonflammable gas formed when fuel containing sulfur is burned, when gasoline is extracted from oil, or when metal is extracted from ore. Examples are petroleum refineries, cement manufacturing, metal processing facilities, locomotives, and ships.	Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid, which can damage marble, iron, and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.
Lead	Metallic elements emitted from metal refineries, smelters, battery manufacturers, iron and steel producers, use of leaded fuels by racing and aircraft industries.	Anemia, high blood pressure, brain and kidney damage, neurological disorders, cancer, lowered IQ. Affects animals, plants, and aquatic ecosystems.

Source: CAPCOA 2021a

2.1.1.2 Toxic Air Contaminants

The Health and Safety Code (§39655, subd. (a).) defines a toxic air contaminant (TAC) as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the Federal Clean Air Act (CAA) (42 United States Code

Section 7412[b]) is a TAC. Under State law, the California Environmental Protection Agency (CalEPA), acting through CARB, is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or that may pose a present or potential hazard to human health.

Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust is referred to as diesel particulate matter (DPM). Almost all DPM is 10 microns or less in diameter, and 90 percent of DPM is less than 2.5 microns in diameter (CARB 2021a). Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung. In 1998, CARB identified DPM as a TAC based on published evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects. DPM has a notable effect on California's population—it is estimated that about 70 percent of total known cancer risk related to air toxics in California is attributable to DPM (CARB 2021a).

2.1.2 Federal Air Quality Regulations

2.1.2.1 Federal Clean Air Act

Air quality is defined by ambient air concentrations of specific pollutants identified by the USEPA to be of concern with respect to health and welfare of the general public. The USEPA is responsible for enforcing the CAA of 1970 and its 1977 and 1990 Amendments. The CAA required the USEPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several criteria pollutants. Table 2, *Ambient Air Quality Standards*, shows the federal and state ambient air quality standards for these pollutants.

Table 2
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards Primary[1]	Federal Standards Secondary[2]
O_3	1 Hour	0.09 ppm (180 µg/m^3)	–	–
	8 Hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Same as Primary
PM_{10}	24 Hour	50 µg/m^3	150 µg/m^3	Same as Primary
	AAM	20 µg/m^3	–	Same as Primary
$PM_{2.5}$	24 Hour	–	35 µg/m^3	Same as Primary
	AAM	12 µg/m^3	12.0 µg/m^3	15.0 µg/m^3
CO	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
NO_2	1 Hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	–
	AAM	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
SO_2	1 Hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	–
	3 Hour	–	–	0.5 ppm (1,300 µg/m^3)
	24 Hour	0.04 ppm (105 µg/m^3)	–	–

Pollutant	Averaging Time	California Standards	Federal Standards Primary[1]	Federal Standards Secondary[2]
Lead	30-day Avg.	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3	Same as Primary
	Rolling 3-month Avg.	–	0.15 µg/m^3	Same as Primary
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per km – visibility ≥ 10 miles (0.07 per km – ≥30 miles for Lake Tahoe)	No Federal Standards	No Federal Standards
Sulfates	24 Hour	25 µg/m^3	No Federal Standards	No Federal Standards
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	No Federal Standards	No Federal Standards
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)	No Federal Standards	No Federal Standards

Source: CARB 2016

[1] National Primary Standards: The levels of air quality necessary, within an adequate margin of safety, to protect the public health.

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

O_3 = ozone; ppm: parts per million; µg/m^3 = micrograms per cubic meter; PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less; AAM = Annual Arithmetic Mean; $PM_{2.5}$ = fine particulate matter; CO = carbon monoxide; mg/m^3 = milligrams per cubic meter; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; km = kilometer; – = No Standard

The USEPA has classified air basins (or portions thereof) as being in "attainment," "nonattainment," "maintenance," or "unclassified" for each criteria air pollutant, based on whether the NAAQS have been achieved. Upon attainment of a standard for which an area was previously designated nonattainment, the area will be classified as a maintenance area. If an area is designated unclassified, it is because inadequate air quality data was available as a basis for a nonattainment or attainment designation. The project site is located within the San Bernadino County portion of the SCAB and, as such, is in an area designated as a nonattainment area for certain pollutants that are regulated under the CAA. Table 3, *South Coast Air Basin Attainment Status*, lists the federal and state attainment status of the SCAB for the criteria pollutants. With respect to federal air quality standards, the USEPA classifies the SCAB as in attainment for PM_{10}, CO, NO_2, SO_2, and lead, and in nonattainment for 8-hour ozone and $PM_{2.5}$.

Table 3
SOUTH COAST AIR BASIN ATTAINMENT STATUS
(SAN BERNADINO COUNTY PORTION)

Criteria Pollutant	Federal Designation	State Designation
O_3 (1-hour)	(No federal standard)	Nonattainment
O_3 (8-hour)	Extreme Nonattainment	Nonattainment
CO	Attainment (Maintenance)	Attainment
PM_{10}	Attainment (Maintenance)	Nonattainment
$PM_{2.5}$	Serious Nonattainment	Nonattainment
NO_2	Attainment (Maintenance)	Attainment
SO_2	Unclassifiable/Attainment	Unclassifiable/Attainment
Lead	Attainment	Attainment
Sulfates	(No federal standard)	Attainment
Hydrogen Sulfide	(No federal standard)	Attainment
Visibility	(No federal standard)	Attainment

Source: SCAQMD 2016a

2.1.3 California Air Quality Regulations

2.1.3.1 California Clean Air Act

The federal CAA allows states to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. CARB, a part of the CalEPA, is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the California Ambient Air Quality Standards (CAAQS). CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

In addition to primary and secondary AAQS, the state has established a set of episode criteria for ozone, CO, NO_2, SO_2, and PM. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that threaten public health. Table 3, above, lists the state attainment status of the SCAB for the criteria pollutants. Under state designation, the SCAB is currently in attainment for CO, NO_2, SO_2, and lead; and in nonattainment for ozone, PM_{10}, and $PM_{2.5}$.

2.1.3.2 State Implementation Plan

The CAA requires areas with unhealthy levels of pollutants to develop plans, known as State Implementation Plans (SIPs). SIPs are comprehensive plans that describe how an area will attain the NAAQS. The 1990 amendments to the CAA set deadlines for attainment based on the severity of an area's air pollution problem.

SIPs are not single documents—they are a compilation of new and previously submitted plans, programs (e.g., monitoring, modeling, permitting), district rules, state regulations and federal controls. Many of California's SIPs rely on a core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations and limits on emissions from consumer products. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and

submit them to CARB for review and approval. CARB forwards the SIP revisions to the USEPA for approval and publication in the Federal Register. The Code of Federal Regulations (CFR) Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items that are included in the California SIP (CARB 2009). At any one time, several California submittals are pending USEPA approval.

2.1.3.3 California Energy Code

California Code of Regulations (CCR) Title 24 Part 6, California's Energy Efficiency Standards for Residential and Nonresidential Buildings, were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Energy-efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for space and water heating) results primarily in GHG emissions. The California Energy Code is discussed in further detail in Section 2.2.4, below.

2.1.4 Local Regulations

2.1.4.1 South Coast Air Quality Management District

Air quality in San Bernadino County is regulated by the SCAQMD. As a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), County transportation commissions, and local governments and cooperates actively with all federal and state government agencies. The SCAQMD develops rules and regulations; establishes permitting requirements for stationary sources; inspects emissions sources; and enforces such measures through educational programs or fines, when necessary.

Air Quality Management Plan

The SCAQMD is responsible for reducing emissions from stationary (area and point), mobile, and indirect sources. It has responded to this requirement by preparing a sequence of Air Quality Management Plans (AQMP).

On March 3, 2017, the SCAQMD adopted the 2016 AQMP, which is a regional and multiagency effort (SCAQMD, CARB, SCAG, and USEPA). The 2016 AQMP represents a comprehensive analysis of emissions, meteorology, atmospheric chemistry, regional growth projections, and the impact of existing control measures. The plan seeks to achieve multiple goals in partnership with other entities promoting reductions in criteria pollutant, GHGs, and toxic risk, as well as efficiencies in energy use, transportation, and goods movement (SCAQMD 2017).

The AQMP, in combination with those from all other California nonattainment areas with serious (or worse) air quality problems, is submitted to CARB, which develops the California SIP. The SIP relies on the same information from SCAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The current federal and state attainment status for the SCAB is presented above, in Table 3.

Rules and Regulations

The following rules promulgated by the SCAQMD would be applicable to construction and/or operation of the project.

Rule 401 – Visible Emissions: Limits the allowable opacity of air contaminant emissions from any single source (SCAQMD 2001).

Rule 402 – Nuisance: Prohibits the discharge of air contaminants, including odors, which cause injury, detriment, nuisance, or annoyance to any considerable number of persons (SCAQMD 1976).

Rule 403 – Fugitive Dust: Requires actions to prevent, reduce or mitigate anthropogenic fugitive dust emissions, including emissions from construction activities. Project construction would be required to implement all applicable fugitive dust best available control measures specified in Table 1 in the rule (SCAQMD 2005).

Rule 445 – Wood Burning Devices: Controls the operation, sale, and installation of wood-burning devices. Permanently installed wood-burning devices (e.g., fireplace, woodstoves) are prohibited in all new developments (SCAQMD 2020).

Rule 113 – Architectural Coating: Establishes VOC limits for architectural coatings (e.g., paints, stains, preservatives). Effective January 1, 2019, building interior and exterior paint is limited to a maximum VOC content of 50 grams per liter (SCAQMD 2016b).

2.2 GREENHOUSE GASES

2.2.1 Climate Change Overview

Global climate change refers to changes in average climatic conditions on Earth including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by atmospheric gases. These gases are commonly referred to as GHGs because they function like a greenhouse by letting sunlight in but preventing heat from escaping, thus warming the Earth's atmosphere.

GHGs are emitted by natural processes and human (anthropogenic) activities. Anthropogenic GHG emissions are primarily associated with: (1) the burning of fossil fuels during motorized transport, electricity generation, natural gas consumption, industrial activity, manufacturing, and other activities; (2) deforestation; (3) agricultural activity; and (4) solid waste decomposition.

The temperature record shows a decades-long trend of warming, with 2016 global surface temperatures ranking as the warmest year on record since 1880. The newest release in long-term warming trends announced 2020 ranked as tied with 2016 for the warmest year on record with an increase of 1.84 degrees Fahrenheit compared to the 1951-1980 average (National Aeronautics and Space Administration [NASA] 2021). GHG emissions from human activities are the most significant driver of observed climate change since the mid-20th century (United Nations Intergovernmental Panel on Climate Change [IPCC] 2007). The IPCC constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The statistical models show a "high confidence" that temperature increase caused by anthropogenic GHG emissions could be kept to less than two degrees Celsius relative to preindustrial levels if atmospheric concentrations are stabilized at about 450 parts per million (ppm) carbon dioxide equivalent (CO_2e) by the year 2100 (IPCC 2014).

2.2.2 Types of Greenhouse Gases

The GHGs defined under California's AB 32 include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Carbon Dioxide. CO_2 is the most important and common anthropogenic GHG. CO_2 is an odorless, colorless GHG. Natural sources include the decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungi; evaporation from oceans; and volcanic outgassing. Anthropogenic sources of CO_2 include burning fuels, such as coal, oil, natural gas, and wood. Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. The atmospheric CO_2 concentration in 2010 was 390 ppm, 39 percent above the concentration at the start of the Industrial Revolution (approximately 280 ppm in 1750). In September 2021, the CO2 concentration was 413 ppm, a 48 percent increase since 1750 (National Oceanic and Atmospheric Administration [NOAA] 2021).

Methane. CH_4 is the main component of natural gas used in homes. A natural source of methane is from the decay of organic matter. Geological deposits known as natural gas fields contain methane, which is extracted for fuel. Other sources are decay of organic material in landfills, fermentation of manure, and cattle digestion.

Nitrous Oxide. N_2O is produced by both natural and human-related sources. N_2O is emitted during agricultural and industrial activities, as well as during the combustion of fossil fuels and solid waste. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic (fatty) acid production, and nitric acid production.

Hydrofluorocarbons. Fluorocarbons are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at Earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, their production was stopped as required by the 1989 Montreal Protocol.

Sulfur Hexafluoride. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

GHGs have long atmospheric lifetimes that range from one year to several thousand years. Long atmospheric lifetimes allow for GHG emissions to disperse around the globe. Because GHG emissions vary widely in the power of their climatic effects, climate scientists have established a unit called global warming potential (GWP). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, a gas with a GWP of 10 is 10 times more potent than CO_2 over 100 years. CO_2e is a quantity that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO_2e.

Historically, GHG emission inventories have been calculated using the GWPs from the IPCC's Second Assessment Report (SAR). In 2007, IPCC updated the GWP values based on the latest science at the time in its Fourth Assessment Report (AR4). The updated GWPs in the IPCC AR4 have begun to be used in recent GHG emissions inventories. In 2013, IPCC again updated the GWP values based on the latest

science in its Fifth Assessment Report (AR5) (IPCC 2013). However, United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines for national inventories require the use of GWP values from the AR4. To comply with international reporting standards under the UNFCCC, official emission estimates for California and the U.S. are reported using AR4 GWP values, and statewide and national GHG inventories have not yet updated their GWP values to the AR5 values. Project GHG emissions in this analysis are reported using the AR4 GWP values.

By applying the GWP ratios, project related CO_2e emissions can be tabulated in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 4, *Global Warming Potentials and Atmospheric Lifetimes*.

Table 4
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES

Greenhouse Gas	Atmospheric Lifetime (years)	IPCC SAR GWP	IPCC AR4 GWP	IPCC AR5 GWP
Carbon Dioxide (CO_2)	50-200	1	1	1
Methane (CH_4)	12	21	25	28
Nitrous Oxide (N_2O)	114	310	298	265
HFC-134a	14	1,300	1,430	1,300
PFC: Tetraflouromethane (CF_4)	50,000	6,500	7,390	6,630
PFC: Hexafluoroethane (C_2F_6)	10,000	9,200	12,200	11,100
Sulfur Hexafluoride (SF_6)	3,200	23,900	22,800	23,500

Source: IPCC 2007
IPCC = Intergovernmental Panel on Climate Change; GWP = global warming potential; HFC = hydrofluorocarbon.
PFC = perfluorocarbon

2.2.3 Federal Greenhouse Gas Regulations

2.2.3.1 Federal Clean Air Act

The U.S. Supreme Court ruled on April 2, 2007, in *Massachusetts v. U.S. Environmental Protection Agency* that CO_2 is an air pollutant, as defined under the CAA, and that the USEPA has the authority to regulate emissions of GHGs. The USEPA announced that GHGs (including CO_2, CH_4, N_2O, HFC, PFC, and SF_6) threaten the public health and welfare of the American people (USEPA 2021). This action was a prerequisite to finalizing the USEPA's GHG emissions standards for light-duty vehicles, which were jointly proposed by the USEPA and the United States Department of Transportation's National Highway Traffic Safety Administration (NHTSA).

2.2.3.2 Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards

The USEPA and the NHTSA worked together on developing a national program of regulations to reduce GHG emissions and to improve fuel economy of light-duty vehicles. The USEPA established the first-ever national GHG emissions standards under the CAA, and the NHTSA established CAFE standards under the Energy Policy and Conservation Act. On April 1, 2010, the USEPA and NHTSA announced a joint Final Rulemaking that established standards for 2012 through 2016 model year vehicles. This was followed up on October 15, 2012, when the agencies issued a Final Rulemaking with standards for model years 2017

through 2025. On March 3, 2020, the agencies released the final Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks (SAFE Vehicles Rule). The purpose of the SAFE Vehicles Rule is "to correct the national automobile fuel economy and GHG emissions standards to give the American people greater access to safer, more affordable vehicles that are cleaner for the environment." The direct effect of the rule is to eliminate the standards that were put in place to gradually raise average fuel economy for passenger cars and light trucks under test conditions from 37 miles per gallon (mpg) in 2020 to 50 mpg in 2025. The new SAFE Vehicles Rule freezes the average fuel economy level standards indefinitely at the 2020 levels. The new SAFE Vehicles Rule also results in the withdraw of the waiver previously provided to California for that State's GHG and zero emissions vehicle (ZEV) programs under Section 209 of the CAA (USEPA and NHTSA 2020). The combined USEPA GHG standards and NHTSA CAFE standards resolve previously conflicting requirements under both federal programs and the standards of the State of California and other states that have adopted the California standards. The SAFE Vehicles Rule Part I (SAFE-1), which withdraws the waiver, was published in September 2019 and Part II (SAFE-2), which finalizes the regulation, was published in April 2020. On April 26, 2021, the USEPA published the Notice of Reconsideration of Previous Withdrawal of a Waiver for California's Advanced Clean Car Program. The purpose of this Notice of Reconsideration is to seek comment on a number of issues in the SAFE-1 action including:

- Whether it was proper for the USEPA to reconsider a previously issued CAA waiver.
- Whether USEPA's actions to withdraw California's waiver was appropriate.
- Whether the SAFE-1 interpretation of the CAA that enabled USEPA to withdraw California's waiver was appropriate.
- Whether the SAFE-1 interpretation of CAA Section 177 that could disallow other states' ability to adopt California GHG emission standards was appropriate.

2.2.4 California Greenhouse Gas Regulations

2.2.4.1 California Code of Regulations, Title 24, Part 6

CCR Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Energy-efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for space or water heating) results in GHG emissions.

The Title 24 standards are updated approximately every three years to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 2019 Title 24 standards went into effect on January 1, 2020. The 2019 update to the Building Energy Efficiency Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings. The most significant efficiency improvement to the residential standards is a requirement for onsite photovoltaic electricity generation (e.g., solar panels) for most new or modified residential building up to three stories high (California Energy Commission [CEC] 2019a).

The 2022 Building Energy Efficiency Standards will improve upon the 2019 Energy Code for new construction of, and additions and alterations to, residential and nonresidential buildings. On August 11, 2021, the CEC adopted the 2022 Energy Code which will be presented to the California Building Standards Commission (CBSC) for approval into the California Building Standards Code in December 2021. If approved, the 2022 Energy Code will go into effect on January 1, 2023 (CEC 2022).

The standards are divided into three basic sets. First, there is a basic set of mandatory requirements that apply to all buildings. Second, there is a set of performance standards—the energy budgets—that vary by climate zone (of which there are 16 in California) and building type; thus, the standards are tailored to local conditions. Finally, the third set constitutes an alternative to the performance standards, which is a set of prescriptive packages that are basically a recipe or a checklist compliance approach.

2.2.4.2 California Green Building Standards Code

The California Green Building Standards Code (CALGreen; CCR Title 24, Part 11) is a code with mandatory requirements for all nonresidential buildings (including industrial buildings) and residential buildings for which no other state agency has authority to adopt green building standards. The current 2019 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings went into effect on January 1, 2020 (CBSC 2019).

The development of CALGreen is intended to (1) cause a reduction in GHG emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

CALGreen contains requirements for storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for the verification that all building systems, like heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

2.2.4.3 Executive Order S-3-05

On June 1, 2005, Executive Order (EO) S-3-05 proclaimed that California is vulnerable to climate change impacts. It declared that increased temperatures could reduce snowpack in the Sierra Nevada, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To avoid or reduce climate change impacts, EO S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

2.2.4.4 Assembly Bill 32 – Global Warming Solution Act of 2006

The California Global Warming Solutions Act of 2006, widely known as AB 32, requires that CARB develop and enforce regulations for the reporting and verification of statewide GHG emissions. CARB is directed by AB 32 to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

2.2.4.5 Executive Order B-30-15

On April 29, 2015, EO B-30-15 established a California GHG emission reduction target of 40 percent below 1990 levels by 2030. The EO aligns California's GHG emission reduction targets with those of leading international governments, including the 28 nation European Union. California is on track to meet or exceed the target of reducing GHGs emissions to 1990 levels by 2020, as established in AB 32. California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the goal established by EO S-3-05 of reducing emissions 80 percent under 1990 levels by 2050.

2.2.4.6 Senate Bill 32

Senate Bill (SB) 32 (Amendments to the California Global Warming Solutions Action of 2006) extends California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EO B-30-15 of 80 percent below 1990 emissions levels by 2050.

2.2.4.7 Assembly Bill 197

A condition of approval for SB 32 was the passage of AB 197. AB 197 requires that CARB consider the social costs of GHG emissions and prioritize direct reductions in GHG emissions at mobile sources and large stationary sources. AB 197 also gives the California legislature more oversight over CARB through the addition of two legislatively appointed members to the CARB Board and the establishment a legislative committee to make recommendations about CARB programs to the legislature.

2.2.4.8 Assembly Bill 1493 – Vehicular Emissions of Greenhouse Gases

AB 1493 (Pavley) requires that CARB develop and adopt regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State." On September 24, 2009, CARB adopted amendments to the Pavley regulations that intend to reduce GHG emissions in new passenger vehicles from 2009 through 2016. The amendments bind California's enforcement of AB 1493 (starting in 2009), while providing vehicle manufacturers with new compliance flexibility. In January 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single packet of standards called Advanced Clean Cars (CARB 2021b).

2.2.4.9 Assembly Bill 341

The state legislature enacted AB 341 (California Public Resource Code Section 42649.2), increasing the diversion target to 75 percent statewide. AB 341 requires all businesses and public entities that generate four cubic yards or more of waste per week to have a recycling program in place. The final regulation was approved by the Office of Administrative Law on May 7, 2012 and went into effect on July 1, 2012.

2.2.4.10 Executive Order S-01-07

This EO, signed by Governor Schwarzenegger on January 18, 2007, directs that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by the year 2020. It orders that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California and directs CARB to determine whether a LCFS can be adopted as a discrete early action measure pursuant to AB 32. CARB approved the LCFS as a discrete early action item with a regulation adopted and implemented in April 2010. Although challenged in 2011, the Ninth Circuit reversed the District Court's opinion and rejected arguments that implementing LCFS violates the interstate commerce clause in September 2013. CARB is therefore continuing to implement the LCFS statewide.

2.2.4.11 Senate Bill 350

Approved by Governor Brown on October 7, 2015, SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. This will increase the use of Renewables Portfolio Standard eligible resources, including solar, wind, biomass, and geothermal. In addition, large utilities are required to develop and submit Integrated Resource Plans to detail how each entity will meet their customers' resource needs, reduce GHG emissions, and increase the use of clean energy.

2.2.4.12 Senate Bill 375

SB 375, the Sustainable Communities and Climate Protection Act of 2008, supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities.

Under the Sustainable Communities Act, CARB sets regional targets for GHG emissions reductions from passenger vehicle use. In 2010, CARB established these targets for 2020 and 2035 for each region covered by one of the State's metropolitan planning organizations (MPOs). CARB periodically reviews and updates the targets, as needed.

Each of California's MPOs must prepare a Sustainable Communities Strategy (SCS) as an integral part of its regional transportation plan (RTP). The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. Once adopted by the MPO, the RTP/SCS guides the transportation policies and investments for the region. CARB must review the adopted SCS to confirm and accept the MPOs' determination that the SCS, if implemented, would meet the regional GHG targets. If the combination of measures in the SCS would not meet the regional targets, the MPO must prepare a separate alternative planning strategy (APS) to meet the targets. The APS is not a part of the RTP. Qualified projects consistent with an approved SCS or Alternative Planning Strategy categorized as "transit priority projects" would receive incentives to streamline CEQA processing.

2.2.4.13 Senate Bill 100

Approved by Governor Brown on September 10, 2018, SB 100 extends the renewable electricity procurement goals and requirements of SB 350. SB 100 requires that all retail sale of electricity to California end-use customers be procured from 100 percent eligible renewable energy resources and zero-carbon resources by the end of 2045.

2.2.4.14 California Air Resources Board: Scoping Plan

On December 11, 2008, the CARB adopted the Scoping Plan (CARB 2008) as directed by AB 32. The Scoping Plan proposes a set of actions designed to reduce overall GHG emissions in California to the levels required by AB 32. Measures applicable to development projects include those related to energy-efficiency building and appliance standards, the use of renewable sources for electricity generation, regional transportation targets, and green building strategy. Relative to transportation, the Scoping Plan includes nine measures or recommended actions related to reducing VMT and vehicle GHGs through fuel and efficiency measures. These measures would be implemented statewide rather than on a project-by-project basis.

In response to EO B-30-15 and SB 32, all state agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. CARB was directed to update the Scoping Plan to reflect the 2030 target (CARB 2014). The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue driving down emissions.

CARB adopted a second update to the Scoping Plan in 2017 to reflect the 2030 target set by EO B3015 and codified by SB 32. The 2017 Climate Change Scoping Plan Update, Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target, was adopted in December 2017. The Scoping Plan Update establishes a proposed framework for California to meet a 40 percent reduction in GHGs by 2030 compared to 1990 levels (CARB 2017).

2.2.5 Regional GHG Policies and Plans

2.2.5.1 San Bernadino County Regional Greenhouse Gas Reduction Plan

The San Bernardino County Regional Greenhouse Gas Reduction Plan (2021) was adopted March 2021 by the San Bernardino Council of Governments (SBCOG). Included in the Plan are items pertaining to Chino Hills, including a table of GHG Reduction Measures and Estimated 2030 Reductions for Chino Hills. The Report shows that the City will reduce its community GHG emissions to a level that is 35.1 percent below its 2008 emissions level by 2030, which corresponds to the attainment of CARB's per capita GHG reduction target for 2030. The City will meet and exceed this goal subject to reduction measures that are technologically feasible and cost-effective through state (100 percent) efforts. The Pavley vehicle standards, the state's low carbon fuel standard, the RPS, and other state measures will significantly reduce GHG emissions in Chino Hills' on-road and building energy sectors in 2030. Chino Hills' reduction plan has the greatest impacts on GHG emissions in the building energy, on-road transportation, and waste sectors.

3.0 EXISTING CONDITIONS

The site is accessed by an unpaved road from Mystic Canyon Drive, located approximately 0.3 mile west of the project site. The project site is mostly vacant, but contains several uses concentrated near an adjacent off-site residential property (the square-shaped cut-out parcel that is not part of the site; see Figure 3). These uses, which are located on the project site, include three existing aboveground oil storage tanks, oil pipelines, scrapyard and storage area, split wood storage, soil piles, two trenches containing construction debris, and access roads. The three tanks include an emergency oil/water tank, an oil/water wash tank, and an oil stock tank (Figure 4, *Existing Oil Facilities on the Project Site*). The

emergency tank is not currently in operation. Each of the existing three tanks on site has a 1,000-oil-barrel capacity. The three tanks are owned by Optima Conservation Resources Exploration, LLC and are associated with oil exploration activities on adjacent property to the west and northwest. The adjacent oil operations are part of a facility that consists of two land leases (the Abarcherli and Langstaff leases) and produces 5 to 25 barrels of oil and 3 to 8 barrels of water per day. The Abarcherli lease is located west and northwest of the project site, and the Langstaff lease is located approximately one mile southwest of the project site. The oil operations on the Abarcherli lease include twelve actively producing wells. Various pipelines (approximately 4 inches in diameter) collect extracted crude oil from the Abarcherli lease facilities on adjacent property to the west and pipe them to the three tanks on the project site. These pipelines traverse the central main canyon that transects the site from west to east. The pipelines are on the ground surface, or in some cases, just below ground surface (see Figure 4). A concrete slab with beehives is located on the northwestern portion of the project site.

The project site is designated Low Density Residential and Agriculture/Ranches in the City's General Plan (City 2015a and 2015b) and is zoned Low Density Residential (R-S) and Agriculture/Ranches (R-A *40-acre minimum lot size). Uses to the north include existing single-family residential uses with a General Plan Land Use designation of Low Density Residential and Medium Density Residential and zoned Planned Development (PD) 57-174 (single-family homes). Hills, with approximate peak elevations ranging from 1,050 to 1,200 feet above mean sea level (amsl) and approximate base elevations ranging from 700 to 860 feet amsl, are located west of the project site. These hills, consisting of vacant land and scattered oil wells, have Agriculture/Ranches and Public Open Space land use designations, and are zoned PD 57-174 (custom lots and open space lots) and Agriculture/Ranches (R-A *40-acre minimum lot size). Oil facilities to the west include well sites that connect with the existing on-site tanks, as well as the West Mahala lease, which is not related to the facilities on the project site. Chino Hills State Park is located west of the project site, beyond the adjacent vacant land and oil uses, approximately 1.7 mile from the project boundary. Vacant land consisting of hills with elevations ranging from approximately 560 to 1,140 feet amsl are located to the south of the project site. These hills to the south have a land use designation of Agriculture/Ranches and are zoned Agriculture/Ranches (R-A *40-acre minimum lot size). To the east (within the square cut-out parcel) is one single-family home consisting of several buildings and a wireless communications facility on land designated Low Density Residential and zoned Low Density Residential (R-S). There is a strip of vacant land to the east of the project site and the adjacent single-family residential structure and wireless communications facility, between the project site boundary and SR 71. This strip of land is outside of the City of Chino Hills and is in unincorporated Riverside County. Riverside County designates this parcel as Open Space-Conservation (OS-C) land uses, with Watercourse, Watershed, and Conservation Areas (W-1) zoning. Table 5, *Project Site and Surrounding Land Uses* summarizes the existing project site and surrounding land uses, and the corresponding General Plan land use and zoning designations.

Table 5
PROJECT SITE AND SURROUNDING LAND USES

Location	Land Use	General Plan Designation	Zoning
Project Site	Vacant land, oil tanks and associated piping, equipment storage, and split wood storage	Low Density Residential, Agriculture/Ranches	Low Density Residential (R-S), Agriculture/Ranches
North	Single-Family Residential	Low Density Residential, Medium Density Residential	Planned Development (PD) 57-174
West	Vacant land consisting of hills, scattered oil wells (including 12 wells connected to on-site tanks and the separate West Mahala lease)[1]	Agriculture/Ranches, Public Open Space	PD 57-174, Agriculture/Ranches
South	Vacant land	Agriculture/Ranches	Agriculture/Ranch
East	Single-Family Residential (one unit), wireless communication facility, SR 71, strip of vacant land[2]	Low Density Residential	Low Density Residential (R-S)

Source: City of Chino Hills 2015a; City of Chino Hills 2015b

[1] Chino Hills State Park is located west of the project site, beyond the adjacent vacant land and oil uses, approximately 1.7 miles from the project boundary.

[2] The strip of vacant land between the project site's eastern boundary and SR 71 is outside of Chino Hills and is in unincorporated Riverside County. Riverside County designates this parcel as Open Space-Conservation (OS-C) land uses, with Watercourse, Watershed, and Conservation Areas (W-1) zoning.

Topographically, the site consists of a large hillside in the southwest portion of the site, and a series of low rolling canyons and ridges in the northeast portion of the site. A major active drainage runs west to east through the upper-middle portion of the site. Smaller canyons between low ridges trend west to east in the southern portion of the proposed development area. Elevations at the project site range from approximately 580 feet amsl in the northeast portion of the property to approximately 1,000 feet amsl in the southwest portion of the property. A Prominent Ridgeline extends approximately 300 feet onto the project site, in the southwestern corner of the site. The Chino Fault transects the central and western portions of the project site. An Earthquake Fault Zone has been delineated on the project site by the State of California in accordance with the Alquist-Priolo Earthquake Fault Zoning Act.

In late October and early November 2020, the Blue Ridge wildfire burned in the hills to the west and south of the project site. In the western portion of the site, a backfire was initiated by local fire officials as a containment method for the wildfire on the adjacent lands. The portion of the site that burned is outside of the area proposed for residential development.

Vegetation on the project site consists primarily of disturbed areas, non-native species, burned habitat, and California sagebrush scrub. The project site consists primarily of burned habitat in the southern and western portion of the site, due to the Blue Ridge wildfire. The remaining native areas that did not burn are mostly California sagebrush scrub and disturbed California sagebrush scrub. A large portion of the project site, in the central and northern areas, consist of disturbed areas and non-native species.

The project area supports three drainage features complexes (Drainages Complexes A, B, and C) consisting of 12 drainage features which are found throughout the project area. Drainage Complex A

generally flows west to east across the site; Drainage Complex B flows south to north in the northern portion of the site; and Drainage Complex C flows west to east in the southeastern portion of the site.

3.1 CLIMATE AND METEOROLOGY

The project site is in the SCAB, which consists of all or part of four counties: Los Angeles, San Bernardino, Riverside, and Orange. The distinctive climate of the SCAB is determined by its terrain and geographic location. The SCAB is a coastal plain with connecting broad valleys and low hills. It is bound by the Pacific Ocean to the southwest and high mountains around the rest of its perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light, average wind speeds.

The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds. Winds in the project area are usually driven by the dominant land/ sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes. At night, the wind generally slows and reverses direction traveling toward the sea. Local canyons can also alter wind direction, with wind tending to flow parallel to the canyons. The vertical dispersion of air pollutants in the SCAB is hampered by the presence of persistent temperature inversions. High pressure systems, such as the semi-permanent high-pressure zone in which the SCAB is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog. The basin-wide occurrence of inversions at 3,500 feet above mean sea level or less averages 191 days per year (SCAQMD 1993).

The predominant wind direction in the vicinity of the project site is from the southwest and the average wind speed is approximately six mph; Iowa Environmental Mesonet [IEM] 2021). The annual average maximum temperature in the project area is approximately 78.2 degrees Fahrenheit (°F), and the annual average minimum temperature is approximately 48.3°F. Total precipitation in the project area averages approximately 12.7 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer (Western Regional Climate Center [WRCC] 2021)

3.2 EXISTING AIR QUALITY

3.2.1 Criteria Pollutants

3.2.1.1 Attainment Designations

Attainment designations are discussed in Section 2.1 and Table 2. The SCAB is a federal and state nonattainment area for 8-hour ozone and $PM_{2.5}$. The SCAB is also a state nonattainment area for 1-hour ozone and PM_{10}.

3.2.1.2 Monitored Air Quality

The SCAQMD maintains monitoring stations to measure ambient concentrations of pollutants in the SCAB. The nearest monitoring station, approximately 11 miles northeast of the project site, is the “Mira Loma Van Buren” air monitoring station. Table 6, *Air Quality Monitoring Data*, presents a summary of

the ambient pollutant concentrations during the most recent three years (2018 through 2020) for which the SCAQMD has reported data.

Table 6
AIR QUALITY MONITORING DATA

Pollutant Standard	2018	2019	2020
Ozone (O_3) – Mira Loma Van Buren			
Maximum concentration 1-hour period (ppm)	0.129	0.131	0.140
Maximum concentration 8-hour period (ppm)	0.108	0.100	0.117
Days above 1-hour state standard (>0.09 ppm)	21	26	51
Days above 8-hour state/federal standard (>0.070 ppm)	57	65	96
Coarse Particulate Matter (PM_{10}) – Mira Loma Van Buren			
Maximum 24-hour concentration (µg/m^3)	98.9	115.7	158.2
Measured Days above 24-hr state standard (>50 µg/m^3)	139.0	89.20	*
Measured Days above 24-hr federal standard (>150 µg/m^3)	0	0	1
Annual average (µg/m^3)	46	45	45
Exceed state annual standard (20 µg/m^3)	Yes	Yes	Yes
Fine Particulate Matter ($PM_{2.5}$) – Mira Loma Van Buren			
Maximum 24-hour concentration (µg/m^3)	89.1	58.2	66.4
Measured Days above 24-hour federal standard (>35 µg/m^3)	6	10	12
Annual average (µg/m^3)	15.1	12.7	16.5
Exceed state and federal annual standard (12 µg/m^3)	Yes	Yes	Yes
Nitrogen Dioxide (NO_2) – Mira Loma Van Buren			
Maximum 1-hour concentration (ppm)	0.054	0.056	0.058
Days above state 1-hour standard (0.18 ppm)	0	0	0
Days above federal 1-hour standard (0.100 ppm)	0	0	0
Annual average (ppm)	0.013	0.012	0.012
Exceed annual federal standard (0.053 ppm)	No	No	No
Exceed annual state standard (0.030 ppm)	No	No	No

Source: CARB 2021c
ppb = parts per billion; ppm = parts per million; µg/m^3 = micrograms per cubic meter, * = insufficient data available.

As shown in Table 6, the 1-hour and 8-hour ozone standards, and the PM_{10}, and $PM_{2.5}$ standards were exceeded numerous times in each of the sample years. Data for NO_2 showed no exceedances.

3.2.2 Greenhouse Gases

In 2018, total GHG emissions worldwide were estimated at 48,900 million metric tons (MMT) of CO_2e emissions (World Resource Institute [WRI] 2021). The U.S. contributed the second largest portion (13 percent) of global GHG emissions in 2018 with 5,790 MMT CO_2e in 2018, of which 82 percent was CO_2 (WRI 2021). On a national level, approximately 30 percent of GHG emissions were associated with transportation and about 34 percent were associated with electricity generation (WRI 2021).

CARB performs statewide GHG inventories. The inventory is divided into six broad sectors: agriculture, commercial and residential, electricity power, industrial, transportation, High GWP (Global Warming Potential), and Recycling and Waste. Emissions are quantified in MMT CO_2e. Table 7, *California Greenhouse Gas Emissions by Sector*, shows the estimated statewide GHG emissions for the years 1990, 2000, 2010, and 2019.

Table 7
CALIFORNIA GREENHOUSE GAS EMISSIONS BY SECTOR

Sector	Emissions (MMT CO_2e) 1990	Emissions (MMT CO_2e) 2000	Emissions (MMT CO_2e) 2010	Emissions (MMT CO_2e) 2019
Agriculture	18.9 (4%)	31.0 (7%)	33.7 (8%)	31.8 (8%)
Commercial and Residential	14.4 (3%)	44.0 (9%)	45.9 (10%)	43.8 (10%)
Electricity Generation	110.5 (26%)	105.0 (22%)	90.3 (20%)	58.8 (14%)
Industrial	105.3 (24%)	96.23 (21%)	91.1 (20%)	88.2 (21%)
Recycling and Waste	29.7 (7%)	7.37 (2%)	8.3 (2%)	8.9 (2%)
Transportation	150.6 (35%)	178.4 (38%)	165.1 (37%)	166.1 (40%)
High GWP substances	1.3 (<1%)	6.3 (1%)	13.5 (3%)	20.6 (5%)
Total	**433.3**	**468.0**	**448.0**	**418.2**

Source: CARB 2007 and CARB 2021d
Totals may not sum due to rounding.
MMT = million metric tons; CO_2e = carbon dioxide equivalent

As shown in Table 7, statewide GHG source emissions totaled 433 MMT CO_2e in 1990, 468 MMT CO_2e in 2000, 448 MMT CO_2e in 2010, and 418 MMT CO_2e in 2019. Transportation-related emissions consistently contribute the most GHG emissions, followed by electricity generation and industrial emissions (CARB 2021d).

Emissions by sector for Chino Hills was shown in the San Bernadino County Regional Greenhouse Gas Reduction Plan (2021). The City's GHG inventory for 2016 is shown below in Table 8, *Chino Hills 2016 Greenhouse Gas Emissions by Sector.*

Table 8
CHINO HILLS 2016 GREENHOUSE GAS EMISSIONS BY SECTOR (MT CO_2e)

Sector	2016
Residential Natural Gas	47130 (11%)
Non-Residential Natural Gas	8921 (2%)
Light-Medium Duty Vehicles	211,216 (48%)
Residential Electricity	45,729 (10%)
Non-Residential Electricity	16,529 (4%)
Heavy-Duty Vehicles	59,900 (14%)
Off-Road Equipment	8,651 (2%)
Wastewater Treatment	2,498 (1%)
Solid Waste Management	22,057 (5%)
Water Transport, Distribution, and Treatment	13,043 (3%)
Agriculture	3,222 (1%)
TOTAL	**438,898**

Source: San Bernadino County Regional Greenhouse Gas Reduction Plan (2021). Table 3-6. Chino Hills 2016 Community Greenhouse Gas Inventory and 2030 and 2045 Forecasts (MT CO_2e).
MT = metric tons; CO_2e = carbon dioxide equivalent

4.0 METHODOLOGY AND SIGNIFICANCE CRITERIA

4.1 METHODOLOGY

Criteria pollutant and GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod), Version 2020.4.0. CalEEMod is a computer model used to estimate air emissions resulting from land development projects throughout the state of California. CalEEMod was developed by CAPCOA in collaboration with the California air quality management and pollution control districts, primarily the SCAQMD. The calculation methodology, source of emission factors used, and default data is described in the CalEEMod User's Guide, and Appendices A, D, and E (CAPCOA 2021b).

In brief, CalEEMod is a computer model that estimates criteria air pollutant and greenhouse gas emissions from mobile (i.e., vehicular) sources, area sources (fireplaces, woodstoves, and landscape maintenance equipment), energy use (electricity and natural gas used in space heating, ventilation, and cooling; lighting; and plug-in appliances), water use and wastewater generation, and solid waste disposal. Emissions are estimated based on land use information input to the model by the user.

In the first module, the user defines the specific land uses that will occur at the project site. The user also selects the appropriate land use setting (urban or rural), operational year, location, climate zone, and utility provider. The input land uses, size features, and population are used throughout CalEEMod in determining default parameters and calculations in each of the subsequent modules. The input land use information consists of land use subtypes (such as the residential subtypes of single-family residential and multi-family medium-rise residential) and their unit or square footage quantities.

Subsequent modules include construction (including off-road vehicle emissions), mobile (on-road vehicle emissions), area sources (architectural coatings [painting], consumer products [cleansers, aerosols, solvents]), water and wastewater, and solid waste. Each module comprises multiple components including an associated mitigation module to account for further reductions in the reported baseline calculations. Other inputs include trip generation rates, trip lengths, vehicle fleet mix (percentage autos, trucks, etc.), trip distribution (percent work to home, etc.), duration of construction phases, construction equipment usage, grading areas, season, and ambient temperature, as well as other parameters.

In various places the user can input additional information and/or override the default assumptions to account for project- or location-specific parameters. For this assessment, the default parameters were not changed unless otherwise noted. The CalEEMod output files are included in Appendix A to this report.

4.1.1 Construction Emissions

CalEEMod has the capability to calculate reductions in construction emissions from the effects of dust control, diesel-engine classifications, and other selected emissions reduction measures. In compliance with SCAQMD Rule 403, fugitive dust emissions calculations assume application of water on exposed surface a minimum of two times per day, enforcing a 15-mph speed limit on unpaved surfaces, and maintaining a minimum 12 percent moisture content in unpaved roads and parking areas within the project site. Based on CalEEMod, Version 2020.4.0 defaults, the control efficiency for watering two times per day is 55 percent.

CalEEMod estimates construction emissions for each year of construction activity based on the annual construction equipment profile and other factors determined as needed to complete all phases of construction by the target completion year. As such, each year of construction activity has varying quantities of GHG emissions. Per SCAQMD guidance, total construction GHG emissions resulting from the project are amortized over 30 years and added to operational GHG emissions.

4.1.1.1 Construction Activities

Construction emissions were estimated based on the timeline provided by the project applicant, which assumes construction would commence with grading in the autumn of 2022 and the first model homes would be complete in late 2024. The quantity, duration, and intensity of construction activity influence the amount of construction emissions and related pollutant concentrations that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction activity is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecasted. If construction is delayed or occurs over a longer time period, emissions could be reduced because of: (1) a more modern and cleaner-burning construction equipment fleet mix than assumed in CalEEMod; and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval).

The proposed grading will not require disposal of soil, except for soil from areas around the oil tank operations. It is expected that this soil or some of it may be classified as non-hazardous petroleum impacted soil. The maximum estimated export would not exceed 19,000 cubic yards. This assumes 15 feet of excavation and removal at all areas of potential contamination. Contaminated soil can be deposited at 14039 Santa Ana Avenue, Fontana.

The construction schedule assumed in the modeling is shown in Table 9, *Anticipated Construction Schedule*.

Table 9
ANTICIPATED CONSTRUCTION SCHEDULE

Construction Activity	Construction Period Start	Construction Period End	Number of Working Days
Demolition	9/1/2022	10/12/2022	30
Site Prep	10/13/2022	11/9/2022	20
Grading	11/10/2022	6/7/2023	150
Paving	6/8/2023	8/9/2023	45
Building Construction	8/10/2023	8/21/2024	270
Architectural Coatings	8/22/2024	10/9/2024	45

Source: Applicant; CalEEMod

4.1.1.2 Construction Off-Road Equipment

Construction would require the use of heavy off-road equipment. Grading construction equipment estimates are based on project-specific information. Table 10, *Construction Equipment Assumptions*, presents a summary of the assumed equipment that would be involved in each stage of construction.

Table 10
CONSTRUCTION EQUIPMENT ASSUMPTIONS

Phase Name	Offroad Equipment Type	Number of Units	Usage Hours	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	1	8	81	0.73
	Excavators	1	8	158	0.38
	Rubber Tired Dozers	2	8	247	0.40
	Tractors/Loaders/Backhoes	1	8	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8	97	0.37
	Excavators	1	8	158	0.38
	Rubber Tired Dozers	1	8	247	0.40
Grading	Crawler Tractor	2	8	212	0.43
	Excavators	1	8	158	0.38
	Graders	1	8	187	0.41
	Rubber Tired Dozers	2	8	247	0.40
	Scrapers	8	8	367	0.48
	Tractors/Loaders/Backhoes	1	8	97	0.37
Paving	Pavers	2	8	130	0.42
	Paving Equipment	2	8	132	0.36
	Rollers	2	8	80	0.38
Building Construction	Cranes	1	8	231	0.29
	Forklifts	3	8	89	0.20
	Generator Sets	1	8	84	0.74
	Tractors/Loaders/Backhoes	3	8	97	0.37
	Welders	1	8	46	0.45
Architectural Coating	Air Compressors	1	8	78	0.48

4.1.1.3 Construction On-Road Trips

Worker commute trips and vendor delivery trips were modeled based on input provided by the Applicant. Worker trips are anticipated to vary between 15 and 150 trips per day, depending on construction activity. The CalEEMod default worker, vendor and haul trip distances were applied. The proposed grading will not require disposal of soil, except for soil from areas around the oil tank operations. It is expected that this soil or some of it may be classified as non-hazardous petroleum impacted soil. The maximum estimated export would not exceed 19,000 cubic yards, requiring 1,188 trucks loads (2,376 one-way truck trips) over the duration of grading (150 days). This assumes 15 feet of excavation and removal at all areas of potential contamination. Contaminated soil can be deposited at 14039 Santa Ana Avenue, Fontana.

4.1.2 Operation Emissions

Operational impacts were estimated using CalEEMod. Operational sources of emissions include area, energy, transportation, water use, and solid waste.

4.1.2.1 Area Source Emissions

Area sources include emissions from landscaping equipment, the use of consumer products, the reapplication of architectural coatings for maintenance, and hearths. Emissions associated with area sources were estimated using the CalEEMod default values except for hearths. In accordance with SCAQMD Rule 445, the project would not include wood burning stoves or fireplaces (SCAQMD 2020).

4.1.2.2 Energy Emissions

Development within the project would use energy for lighting, heating, and cooling. Direct emissions from the burning of natural gas may result from furnaces, hot water heaters, and kitchen appliances. Electricity generation typically entails the combustion of fossil fuels, including natural gas and coal, which is then transmitted to end users. A building's electricity use is thus associated with the off-site or indirect emission of GHGs at the source of electricity generation (power plant).

Energy source emissions were estimated assuming implementation of energy-reducing project design features to comply with the 2019 Title 24 standards which include a requirement for new residential buildings with three or fewer residential floors to have on-site generation of electricity through photovoltaic (solar) panels. Based on the number and size of the dwelling units, the project would require solar panels rated at a minimum of 605 kilowatts (kW).[2] The annual electricity generated by a rooftop mounted solar power system varies by the climate, amount of sunlight available per day, the pitch and orientation of the roof, and the efficiency of the electrical transmission. Assuming a capacity factor (CF) of 20%, which accounts for climate, daylight hours, roof pitch and orientation, and transmission loss, the power produced by the project's solar panels would be approximately 1,061,037 kilowatt-hours (kWhr) per year.[3] The complete solar power requirement calculations are included in Appendix C to this report.

4.1.2.3 Vehicular (Mobile) Sources

Operational emissions from mobile source emissions are associated with project-related vehicle trip generation and trip length. Based on the trip generation rate from the Traffic Impact Analysis (TIA) prepared for the project, the project would generate 1,501 average daily trips (LLG Engineers 2021).

4.1.2.4 Solid Waste Sources

The disposal of solid waste produces GHG emissions from anaerobic decomposition in landfills, incineration, and transportation of waste. CalEEMod determines the GHG emissions associated with disposal of solid waste into landfills. Portions of these emissions are biogenic. CalEEMod methods for quantifying GHG emissions from solid waste are based on the IPCC method using the degradable organic content of waste. A conservative 25 percent solid waste diversion rate was applied in CalEEMod to account for mandatory compliance with AB 341 which is not included in the model defaults.

[2] Per the 2019 Title 24 residential building energy efficiency requirements, the minimum solar electrical generation required is calculated by kW = (CFA x A)/1000 + (DU * B), where CFA is the conditioned floor area, A is 0.572 (climate zone 10 adjustment factor), DU is the total number of dwelling units, and B is 1.15 (climate zone dwelling unit factor).

[3] Solar kWhr per year can be calculated by: kWhr/year = Power Output (kW) x 24 hours/day x 365 days/year x CF, where CF is a capacity factor which accounts for climate, daylight hours, roof pitch and orientation, and transmission loss. For typical California residential systems, the CF can range between 17% and 22.5%. A CF of 20% was used in the project calculations.

4.1.2.5 Water Sources

Water-related GHG emissions are from the conveyance and treatment of water. CalEEMod uses the CEC's 2006 *Refining Estimates of Water-Related Energy Use in California* to establish default water related emission factors. Modeling was conducted using these defaults and a 20 percent reduction in potable water use and wastewater generation in accordance with 2019 CALGreen requirements not accounted for in the model defaults.

4.1.3 Localized Significance Threshold Methodology

As part of the SCAQMD's environmental justice program, more attention has been focused on localized air quality effects. Also, while regional impact analysis is based on attaining or maintaining regional emissions standards, localized impact analysis compares the concentration of a pollutant at a receptor site to a health-based standard.

SCAQMD has developed a localized significance threshold (LST) methodology and mass rate look-up tables by source receptor area (SRA) that can be used by public agencies to determine whether a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard; they are developed based on the ambient concentrations of that pollutant for each SRA (SCAQMD 2009). The LST methodology translates the concentration standards into emissions thresholds that are a function of project site area, source to receptor distance, and the location within the SCAB. The LST methodology is recommended to be limited to projects of 5 acres or less and to avoid the need for complex dispersion modeling. For projects that exceed 5 acres, such as the proposed project, the 5-acre LST look-up values can be used as a screening tool to determine which pollutants require detailed analysis (Sun 2017). This approach is conservative as it assumes that all on-site emissions would occur within a 5-acre area and over-predicts potential localized impacts (i.e., more pollutant emissions occurring within a smaller area and within closer proximity to potential sensitive receptors). If a project exceeds the LST look up values, then the SCAQMD recommends that project-specific localized air quality modeling be performed.

The closest receptors are the multiple single-family residences along the north boundary of the project site. Therefore, the LSTs in SRA 33 for receptors located with 82 feet (25 meters) are used for project sites less than or equal to 5 acres.

4.1.4 Toxic Air Contaminants

4.1.4.1 Construction Diesel Particulate Matter Emissions

Construction projects are not considered stationary sources of TAC emissions subject to Assembly Bill (AB) 2588 reporting or health risk assessment requirements. Potential health risks to nearby sensitive receptors from the emission of TACs during construction at the project site were analyzed in accordance with the applicable portions of the OEHHA *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* and the SCAQMD *AB 2588 and Rule 1402 Supplemental Guidelines*.[4] [5] The methodology and results of the construction Health Risk Assessment (HRA) presented below assumes the total annual emissions averaged over the duration of the construction period and

[4] OEHHA, Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, February 2015.
[5] SCAQMD, AB 2588 and Rule 1402 Supplemental Guidelines, July 2018.

distributed throughout the project site areas that would include substantial construction activity. In the HRA, annual average emissions were assumed to occur throughout the approximately two-year construction period.

Cancer burden is the estimated increase in the occurrence of cancer cases in a population subject to a maximum individual cancer risk of greater than or equal to one in one million resulting from exposure to toxic air contaminants from a source or project. The definition, threshold, and calculation methodology for cancer burden come from the SCAQMD Rule 1402 and Risk Assessment Procedures for Rules 1401, 1401.2 and 212. These rules are applicable to facilities subject to AB 2588 or that are required by the SCAQMD to prepare an Air Toxics Inventory Report, Health Risk Assessment, or Risk Reduction Plan, and are not applicable to the project.[6] However, the SCAQMD's CEQA Air Quality Handbook and SCAQMD's supplemental online guidance/information do not require a health risk assessment for short-term construction emissions. In addition, cancer burden is calculated assuming a 70-year exposure duration.[7] Because the project construction activities are anticipated to last just over two years, an analysis of risks with an exposure of 70 years would not yield meaningful results. Therefore, an assessment of cancer burden is not included in this HRA for construction-period DPM emissions.

Toxic Air Contaminant Emissions

The primary TAC of concern for construction projects utilizing diesel off-road equipment is DPM. The emissions of DPM used in the risk assessment were calculated utilizing the CalEEMod output data. Emissions modeling programs such as CalEEMod do not estimate DPM emissions directly. Because almost all DPM is 10 microns or less in diameter, PM_{10} emissions from diesel-powered vehicle exhaust are considered a proxy for DPM.

Dispersion Modeling

Localized DPM concentrations were modeled using Lakes AERMOD View version 10.0.0.

Source Parameters

Construction emissions were modeled as an area source[8] defined as a single polygon encompassing the areas within the project site with significant improvements where construction activity is anticipated to be concentrated and excluding (to the extent practicable) areas with minimal disturbance. In accordance with the SCAQMD LST Guidance Methodology, the initial plume height was set to 1.4 meters and the release height was set to 5 meters.

The AERMOD dispersion modeling program requires that the user specify whether a site should be modeled as either urban or rural. The urban option allows the user to incorporate the effects of increased surface heating from an urban area on pollutant dispersion under stable atmospheric conditions. Based on SCAQMD's AERMOD modeling guidance, all air quality impact analyses in the Air Basin should be executed using the urban modeling option. In addition, all sources should be modeled with urban effects using the population of the County where the project is located. As SCAQMD provides

6 SCAQMD, Rule 1402 Control of Toxic Air Contaminants from Existing Sources, 2016.

7 SCAQMD, Risk Assessment Procedures for Rules 1401, 1401.1 and 212, September 2016.

8 Area sources are sources of pollution which emit a substance or radiation from a specified area, as opposed to a specific stationary point (such as an exhaust stack), volume source (such as dust from uncovered gravel piles), or a line source (such as vehicles on a highway).

the various County populations within the SCAQMD jurisdiction, a population of 2,035,210 for San Bernardino County was used in AERMOD.

Meteorological Data

The AERMOD dispersion modeling program requires the following hourly surface meteorological data: wind speed, wind direction, ambient temperature, and opaque cloud cover. These meteorological variables are used to estimate air dispersion of pollutants in the atmosphere. Wind speed determines how rapidly pollutants are diluted and influences the rise of the emission plume in the air, thus affecting downwind pollutant concentrations. Wind direction determines where pollutants will be transported. The opaque cloud cover and upper air sounding data are used in calculations to determine other important dispersion parameters. These include atmospheric stability (a measure of turbulence and the rate at which pollutants disperse laterally and vertically) and mixing height (the vertical depth of the atmosphere within which dispersion occurs). The greater the mixing height is, the larger the volume of atmosphere is available to dilute the pollutant concentration.

The SCAQMD provides pre-processed meteorological data suitable for use with AERMOD for projects within the Air Basin.[9] The available data set most representative of conditions in the project vicinity was from the Chino Airport station, approximately 3.5 miles northwest of the project site. The Chino Airport set includes 5 years of data collected from 2012 to 2016. A wind rose for the Chino Airport shows an average wind speed of 6.2 mph from the west.[10] The wind rose graphic is included in Appendix B to this report.

Terrain Data

United States Geological Survey (USGS) National Elevation Dataset (NED) files with a 30-meter resolution covering an area approximately one kilometer around the project site were used in the model to cover the analysis area. Terrain data was imported to the model using AERMAP (a terrain preprocessing program for AERMOD).

Receptor Modeling

To develop isopleths (linear contours showing equal levels of risk or concentration) and ensure that the zone of impact (the area subject to an added cancer risk of one in one million or greater) was captured, receptors were placed in a two-kilometer square cartesian grid, centered on the project site with a grid spacing of 50 meters and a receptor height (flagpole height) of 1.5 meters (5 feet) above the ground. This receptor grid placement is less than the SCAQMD recommended maximum grid spacing of 75 meters for facilities between 25 and 100 acres.[11] Additional discrete receptors were placed on individual residences adjacent the project boundary. In total, 1,688 receptor locations were evaluated in the model.

[9] SCAQMD, Meteorological Stations & Years of Meteorological Data, 2020, http://www.aqmd.gov/home/air-quality/meteorological-data/aermod-table-1.

[10] SCAQMD, Meteorological Stations & Years of Meteorological Data, 2020, http://www.aqmd.gov/home/air-quality/meteorological-data/aermod-table-1.

[11] SCAQMD, AB 2588 and Rule 1402 Supplemental Guidelines, July 2018.

Risk Determination

The OEHHA Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments was intended to provide guidance for evaluating health risks for projects subject the Air Toxics Hot Spots Information and Assessment Act of 1987. OEHHA recognizes that lead agencies sometimes use the protocols and methodologies in Guidance Manual for assessing the health risks associated with short-term projects such as construction. OEHHA recommends that the potential exposure from project construction lasting more than 6-months be evaluated for the duration of the project.[12] Therefore, the exposure duration of the evaluation of project construction health risks from TACs was set to two years.

Plot files from AERMOD, using unitized emissions (one gram per second) for total pollutant emissions, were imported into CARB's Hotspots Analysis and Reporting Program (HARP), Air Dispersion Modeling and Risk Tool (ADMRT) version 21081. The ADMRT calculated ground-level concentrations utilizing the imported plot files and the annual and hourly emissions inventories estimated from the CalEEMod outputs as described above.

Health risks resulting from localized concentration of DPM were estimated using the ADMRT. The latest cancer slope factors, chronic recommended exposure limits (RELs), and exposure pathways for all TACs designated by CARB are included in the ADMRT. For the residential cancer risk, an exposure duration of two years was selected in corresponding to the anticipated construction duration. Fraction of time at home adjustments were selected in the model in accordance with OEHHA recommendations resulting in exposures between 17 and 21 hours per day (depending on the age group, starting with infants in utero in the third trimester of pregnancy). The model conservatively assumes that residents would be standing and breathing in the residence's primary outdoor space closest to the project site every day for two years. The CARB data for DPM only lists a cancer slope and chronic relative exposure level (REL) for the inhalation pathway, acute risks and other pathways do not need to be evaluated for DPM health risks. The OEHHA derived intake rate percentile method was selected.

4.2 SIGNIFICANCE CRITERIA

4.2.1 Air Quality

Thresholds used to evaluate potential air quality and odor impacts are based on applicable criteria in the State's California Environmental Quality Act (CEQA) Guidelines Appendix G. A significant air quality and/or odor impact could occur if the implementation of the proposed project would:

1. Conflict with or obstruct implementation of the SCAQMD Air Quality Management Plan, or applicable portions of the SIP; or

2. Result in a cumulatively considerable net increase of any criteria pollutant for which the SCAB is non-attainment under an applicable NAAQS or CAAQS; or

3. Expose sensitive receptors to substantial pollutant concentrations; or

4. Results in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

[12] OEHHA, Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, February 2015.

Appendix G of the State CEQA Guidelines states that the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. The SCAQMD has established significance thresholds to assess the regional and localized impacts of project-related air pollutant emissions. The significance thresholds are updated, as needed, to appropriately represent the most current technical information and attainment status in the SCAB. Table 11, *SCAQMD Thresholds of Significance*, presents the most current significance thresholds, including regional daily thresholds for short-term construction and long-term operational emissions; maximum incremental cancer risk and hazard indices for TACs; and maximum ambient concentrations for exposure of sensitive receptors to localized pollutants. A project with daily emission rates, risk values, or concentrations below these thresholds is generally considered to have a less than significant effect on air quality.

Table 11
SCAQMD THRESHOLDS OF SIGNIFICANCE

Pollutant	Construction	Operation
Mass Daily Thresholds (pounds per day)		
VOC	75	55
NO_X	100	55
CO	550	550
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
Lead	3	3
Toxic Air Contaminants		
TACs	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Ambient Air Quality for Criteria Pollutants		
NO_2	1-hour average ≥ 0.18 ppm Annual average ≥ 0.03 ppm	
CO	1-hour average ≥ 20.0 ppm (state) 8-hour average ≥ 9.0 ppm (state/federal)	
PM_{10}	24-hour average ≥ 10.4 µg/m^3 (construction) 24-hour average ≥ 2.5 µg/m^3 (operation) Annual average ≥ 1.0 µg/m^3	
$PM_{2.5}$	24-hour average ≥ 10.4 µg/m^3 (construction) 24-hour average ≥ 2.5 µg/m^3 (operation)	
SO_2	1-hour average ≥ 0.075 ppm 24-hour average ≥ 0.04 ppm	

Source: SCAQMD 2015
lbs/day = pounds per day; VOC = volatile organic compound; NO_X = nitrogen oxides; CO = carbon monoxide.
PM_{10} = respirable particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = fine particulate matter with a diameter of 2.5 microns or less; SO_X = sulfur oxides; TACs = toxic air contaminants; GHG = greenhouse gas emissions.
MT/yr = metric tons per year; CO_2e = carbon dioxide equivalent; NO_2 = nitrogen dioxide; ppm = parts per million; µg/m^3 = micrograms per cubic meter

4.2.2 Greenhouse Gases

Given the relatively small levels of emissions generated by a typical development in relationship to the total amount of GHG emissions generated on a national or global basis, individual development projects are not expected to result in significant, direct impacts with respect to climate change. However, given the magnitude of the impact of GHG emissions on the global climate, GHG emissions from new development could result in significant, cumulative impacts with respect to climate change. Therefore, the potential for a significant GHG impact is limited to cumulative impacts.

According to Appendix G of the CEQA Guidelines, a project would have a significant environmental impact if it would:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

There are no established federal, state, or local quantitative thresholds applicable to the project to determine the quantity of GHG emissions that may have a significant effect on the environment. CARB, the SCAQMD, and various cities and agencies have proposed, or adopted on an interim basis, thresholds of significance that require the implementation of GHG emission reduction measures. For the proposed project, the most appropriate screening threshold for determining GHG emissions is the SCAQMD proposed Tier 3 screening threshold (SCAQMD 2010); therefore, a significant impact would occur if the proposed project would exceed the SCAQMD proposed Tier 3 screening threshold of 3,000 MT CO_2e per year.

As discussed in Section 2.2.5, The San Bernardino County Regional Greenhouse Gas Reduction Plan (2021) was adopted March 2021 by the San Bernardino Council of Governments (SBCOG). Included in the Plan are items pertaining to Chino Hills, including a table of GHG Reduction Measures and Estimated 2030 Reductions for Chino Hills. The Report shows that the City will reduce its community GHG emissions to a level that is 35.1% below its 2008 emissions level by 2030, which corresponds to the attainment of the California Air Resource Board's per capita GHG reduction target for 2030. The City will meet and exceed this goal subject to reduction measures that are technologically feasible and cost-effective through state efforts. The Pavley vehicle standards, the state's low carbon fuel standard, the RPS, and other state measures will significantly reduce GHG emissions in Chino Hills' on-road and building energy sectors in 2030. Chino Hills' reduction plan has the greatest impacts on GHG emissions in the building energy, on-road transportation, and waste sectors.

5.0 AIR QUALITY IMPACT ANALYSIS

This section evaluates potential direct impacts of the proposed project related to the air pollutant emissions. Project-level air quality modeling was completed as part of this analysis. Complete modeling results are included as Appendix A of this report.

5.1 ISSUE 1: CONSISTENCY WITH AIR QUALITY PLANS

5.1.1 Impacts

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, economy, community development, and environment. Regarding air quality planning, SCAG has prepared the RTP/SCS, a long-range transportation plan that uses growth forecasts to project trends out over a 20-year period to identify regional transportation strategies to address mobility needs. These growth forecasts form the basis for the land use and transportation control portions of the AQMP. These documents are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. Both the RTP/SCS and AQMP are based, in part, on projections originating with County and City General Plans.[13]

The proposed project is designed to be consistent with the City of Chino Hills General Plan and Chino Hills Zoning Code. The existing General Plan land use designation is split between two residential land uses, Agriculture Ranch and Low Density Residential. In addition, the zoning for the property is split between two residential zoning districts, R-S Low Density Residential and R-A Agriculture/Ranches. The location of the split occurs at the same location for both land use and zoning. As proposed, all residential development would occur in the Low-Density Residential land use designated, R-S zoned portion of the site. As such, the project's growth is accounted for in the AQMP. Therefore, the proposed project would not conflict with or obstruct implementation of the most recent AQMP.

5.1.2 Significance of Impacts

Implementation of the project would not conflict with or obstruct implementation of the AQMP, and the impact would be less than significant.

5.1.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

5.1.4 Significance After Mitigation

Impacts related to conflicts with the applicable air quality plan would be less than significant.

5.2 ISSUE 2: CUMULATIVELY CONSIDERABLE NET INCREASE OF NONATTAINMENT CRITERIA POLLUTANTS

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development within the SCAB. The region is a federal and/or state nonattainment area for ozone, PM_{10} and $PM_{2.5}$. In accordance with CEQA Guidelines Section 15064(h)(3), the SCAQMD's approach for assessing cumulative impacts is based on the AQMP forecasts of attainment of ambient air quality standards in accordance with the requirements of the federal and State Clean Air Acts. If a project conflicts with the AQMP, which is intended to bring the SCAB into attainment for all criteria pollutants, that project can be considered cumulatively considerable. Additionally, if the mass regional emissions calculated for a project exceed the applicable

[13] SCAG serves as the federally designated metropolitan planning organization for the southern California region.

SCAQMD daily significance thresholds that are designed to assist the region in attaining the applicable state and national ambient air quality standards, that project can be considered cumulatively considerable. As discussed in Issue 1, above, the project would not conflict with or obstruct implementation of the AQMP. A comparison of the project mass regional emissions with the applicable SCAQMD daily significance thresholds is provided below.

5.2.1 Impacts

The project would generate criteria pollutants and precursors in the short-term during construction and the long-term during operation. To determine whether a project would result in cumulatively considerable emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation, a project's emissions are evaluated based on the quantitative emission thresholds established by the SCAQMD (as shown in Table 11).

5.2.1.1 Construction

The project's construction emissions were estimated using the CalEEMod model as described in Section 4.1.1. Additional details of phasing, selection of construction equipment, and other input parameters, including CalEEMod data, are included in Appendix A.

The results of the calculations for project construction are shown in Table 12, *Unmitigated Daily Construction Emissions*. The data are presented as the maximum anticipated daily emissions for comparison with the SCAQMD thresholds.

Table 12
UNMITIGATED DAILY CONSTRUCTION EMISSIONS

Phase	ROG (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Demolition	2.53	25.41	17.55	0.04	2.03	1.28
Site Preparation	1.31	13.13	10.14	0.02	3.93	2.17
Grading	10.17	113.39	71.70	0.18	15.55	7.80
Paving	1.11	10.66	15.35	0.03	0.81	0.55
Building Construction	2.25	16.94	23.18	0.06	3.35	1.39
Architectural Coating	51.86	1.30	2.96	0.01	0.51	0.18
Maximum Daily Emissions	**51.86**	**113.39**	**71.70**	**0.18**	**15.55**	**7.80**
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Significant Impact?	*No*	***Yes***	*No*	*No*	*No*	*No*

Source: CalEEMod.
lbs/day = pounds per day; ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

As shown in Table 12, the maximum daily unmitigated emissions for NOx of 113 pounds per day during the grading phase would exceed the SCAQMD significance threshold. As discussed previously, NO_X is an ozone precursor. Potential health effects from exposure to ozone and NO_2 are discussed in Section 2.1.1 and Table 1. The exceedance is largely due to the number of pieces of offroad equipment required for grading activities. As shown previously in Table 10, grading would require the use of up to 15 pieces of offroad construction equipment, including 8 scrapers. Therefore, the impact would be potentially significant if not mitigated.

5.2.1.2 Operation

The project's operational emissions were estimated using the CalEEMod model as described in Section 4.1.2. Model outputs are provided in Appendix A. Table 13, *Unmitigated Maximum Daily Operational Emissions*, presents the summary of operational emissions for the project. The data are presented as the maximum anticipated daily emissions for comparison with the SCAQMD thresholds.

Table 13
UNMITIGATED DAILY OPERATIONAL EMISSIONS

Category	ROG (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Area	6.76	0.15	13.12	<0.01	0.07	0.07
Energy	0.13	1.15	0.50	<0.01	0.09	0.09
Mobile	5.27	6.75	58.73	0.14	15.47	4.19
Maximum Daily Emissions[1]	**12.17**	**8.06**	**72.35**	**0.15**	**15.63**	**4.35**
SCAQMD Thresholds	*55*	*55*	*550*	*150*	*150*	*55*
Significant Impact?	*No*	*No*	*No*	*No*	*No*	*No*

Source: CalEEMod (output data is provided in Appendix A)
[1] Totals may not sum due to rounding.
lbs/day = pounds per day; ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

As shown in Table 13, project emissions during operation would not exceed the daily thresholds set by the SCAQMD.

5.2.2 Significance of Impacts

The maximum daily construction period unmitigated emissions for NOx would exceed the SCAQMD significance threshold, and the impact would be potentially significant if not mitigated.

Long-term operation of the project would not result in criteria pollutant or precursor emissions that would exceed the SCAQMD significance thresholds. Operational impacts would be less than significant.

5.2.3 Mitigation Framework

The following mitigation measure would be required to reduce emissions of NO_X during project construction.

AQ-1 **Tier IV Off-Road Construction Equipment.** All off-road diesel-powered equipment rated at 50 horsepower or greater used on the project site during construction of the project shall be USEPA Tier IV (or better) certified or have CARB approved engine/exhaust retrofit kits to result in equivalent emissions. Prior to issuing permits, the City shall verify that construction contracts specify the off-road equipment certification or retrofit requirements. The applicant shall compile and maintain an inventory, including documentation of engine certification or emissions retrofits, of all off-road diesel-powered equipment rated at 50 horsepower or greater used on the project site during construction. The inventory shall be available for review and verification by the City on demand.

5.2.4 Significance After Mitigation

The results of the calculations for project construction, with mitigation measure AQ-1 implemented, are shown in Table 14, *Mitigated Daily Construction Emissions*.

Table 14
MITIGATED DAILY CONSTRUCTION EMISSIONS

Phase	ROG (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Demolition	0.50	3.18	19.01	0.04	0.87	0.21
Site Preparation	0.32	1.77	11.16	0.02	3.34	1.63
Grading	2.25	12.53	80.34	0.18	11.17	3.77
Paving	0.35	1.68	18.07	0.03	0.31	0.09
Building Construction	1.17	5.17	24.14	0.06	2.71	0.79
Architectural Coating	51.71	0.21	2.98	0.01	0.45	0.12
Maximum Daily Emissions	**51.71**	**12.53**	**80.34**	**0.18**	**11.17**	**3.77**
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Significant Impact?	*No*	*No*	*No*	*No*	*No*	*No*

Source: CalEEMod
lbs/day = pounds per day; ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

As shown in Table 14, with implementation of mitigation measure AQ-1, emissions of criteria pollutants and precursors would not exceed the SCAQMD significance thresholds.

The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the SCAB is non-attainment, and the impact would less than significant with mitigation incorporated.

5.3 ISSUE 3: IMPACTS TO SENSITIVE RECEPTORS

5.3.1 Impacts

5.3.1.1 Construction Activities

Criteria Pollutants

The localized effects from the on-site portion of daily construction emissions were evaluated at sensitive receptor locations potentially impacted by the project according to the SCAQMD's LST method, described above. The proposed project is within SRA 33, Southwest San Bernadino Valley. Consistent with the LST guidelines, when quantifying mass emissions for localized analysis, only emissions that occur on site are considered. Emissions related to off-site delivery/haul truck activity and construction worker trips are not considered in the evaluation of construction-related localized impacts, as these do not contribute to emissions generated on a project site, but rather occur as far away as 20 miles depending on the trip type. The closest sensitive receptors are the many single-family residences adjacent to the north boundary of the project site and the separate property near the center of the proposed project. Therefore, the LSTs in SRA 33 for receptors located less than 82 feet (25 meters) are

used for project sites greater than 5 acres. Table 15, *Unmitigated Maximum Localized Daily Construction Emissions*, shows the localized construction emissions without implementation of mitigation.

Table 15
UNMITIGATED MAXIMUM LOCALIZED DAILY CONSTRUCTION EMISSIONS

Activity	NO_X (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Demolition	23.84	16.32	1.56	1.14
Site Preparation	12.25	9.08	3.54	2.06
Grading	109.86	70.01	14.86	7.59
Paving	10.19	14.58	0.51	0.47
Building Construction	14.38	16.24	0.70	0.66
Architectural Coating	1.22	1.81	0.06	0.06
Maximum Daily Emissions	**109.86**	**70.01**	**14.86**	**7.59**
SCAQMD LST Thresholds (25 meters)	*270*	*2,193*	*16*	*9*
Exceed LST?	*No*	*No*	*No*	*No*

Source: CalEEMod (output data is provided in Appendix A)
lbs/day = pounds per day; NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10} = particulate matter 10 microns or less in diameter; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

As shown in Table 15, localized emissions for all criteria pollutants would remain below their respective SCAQMD LSTs at 82 feet (25 meters). Construction of the project would not result in exposure of sensitive receptors to substantial localized concentrations of criteria pollutants and precursors.

Toxic Air Contaminants

Implementation of the project would result in the use of heavy-duty construction equipment, haul trucks, and construction worker vehicles with diesel engines. Diesel engines emit a complex mixture of air pollutants, including gaseous material and DPM. CARB has declared that DPM from diesel engine exhaust a TAC. Additionally, OEHHA has determined that chronic exposure to DPM can cause carcinogenic and non-carcinogenic health effects. The greatest potential for TAC emissions during construction would be from diesel particulate emissions associated with heavy equipment operations.

Generation of DPM from construction projects typically occurs in a localized area (e.g., near locations with multiple pieces of heavy construction equipment working in close proximity) for a short period of time. Because construction activities and subsequent emissions vary depending on the phase of construction, the construction-related emissions to which nearby receptors are exposed to would also vary throughout the construction period; however, to present a conservative analysis for the entire construction duration, the average annual DPM emissions were assumed to occur every day for the entire construction period. The average annual emissions were calculated by dividing the total on-site PM_{10} exhaust emissions as calculated by CalEEMod by the total construction period.

The dose (of TAC) to which receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance in the environment and the extent of exposure a person has with the substance; a longer exposure period to a fixed amount of emissions would result in higher health risks.

The incremental excess cancer risk is an estimate of the chance a person exposed to a specific source of a TAC may have of developing cancer from that exposure beyond the individual's risk of developing

cancer from existing background levels of TACs in the ambient air. For context, the average cancer risk from TACs in the ambient air for an individual living in California was estimated to be 730 per million. Of this total, 520 per million are due to diesel particulate matter (CARB 2021). Cancer risk estimates do not mean, and should not be interpreted to mean, that a person will develop cancer from estimated exposures to toxic air pollutants.

Health risks associated with chronic effects from TAC exposure are quantified using the maximum hazard index. A hazard index is the potential exposure to a substance divided by the REL (the level at which no adverse effects are expected). A hazard index of less than one indicates no adverse health effects are expected from the potential exposure to the substance. The maximum hazard index is the sum of hazard indices for pollutants with non-cancer health effects that have the same or similar adverse health effects. It should be noted that directly correlating a project's TAC exposure pollutant emissions with anticipated health effects is currently infeasible because no expert agency (including SCAQMD) has approved a quantitative method to translate TAC exposure reliably and meaningfully to specific health effects for the typical project-specific scale. As such, the health risk from TAC exposure, as quantified using the hazard index, cannot be directly correlated to the specific instances of chronic or acute effects.

In accordance with the OEHHA HRA guidance manual (OEHHA 2015), the location and estimated health risks must be reported for the following three points:

- The maximum estimated off-site impact or point of maximum impact (PMI)—the geographic point outside of the Project site with the highest estimated incremental cancer risk and maximum non-cancer hazard index,

- The maximum exposed individual resident at an existing residential receptor (MEIR)—the geographic point with the highest estimated incremental cancer risk and maximum non-cancer hazard index in the outdoor space of a residential property where it is probable that a resident would be located for extended periods,

- The maximum exposed individual at an existing occupational worker receptor (MEIW).

Results for these modeled locations are presented in Table 16, *Unmitigated Health Risk Summary*.

Table 16
UNMITIGATED HEALTH RISK SUMMARY

Receptor Description	Residential Cancer Risk[1]	Noncancer Chronic[2]
PMI	51.90	0.03
MEIR	26.45	0.02

Source: ADMRT (output data is provided in Appendix B)
[1] Risk in increased chances per million.
[2] Hazard Index.

The modeled PMI for the project would be near the project boundary within the cutout area near the center of the site at Universal Transverse Mercator (UTM) coordinates Zone 11, 439250 meters east, 3753800 meters north. As shown in Table 16, the maximum health risk exposure at this point would be a residential incremental cancer risk of 51.90 in 1 million and a residential non-cancer chronic maximum hazard index of 0.03. No residential buildings or residential outdoor spaces are near the PMI.

The MEIR is located at the existing house on the eastern boundary of the project at UTM coordinates Zone 11, 439365 meters east, 3753677 meters north. As shown in Table 16, at this residence, the cancer risk would be 26.45 in a 1 million. The chronic hazard index would be 0.02.

There are no existing occupational worker sites within the evaluated area. Workers employed at existing residences, or residents who work at home, are included in the residential health risk evaluation. Therefore, the health risk for the MEIW would not exceed risks reported above for the MEIR.

The maximum risk due to exposure to DPM emissions from construction of the proposed project would not exceed the SCAQMD threshold for a maximum non-cancer chronic health index of 1. However, the incremental increased cancer risk would exceed the SCAQMD threshold of 10 in 1 million. Therefore, construction of the project would result in a potentially significant impact related to the exposure of sensitive receptors to substantial DPM concentrations.

5.3.1.2 Operational Activities

CO Hotspots

Vehicle exhaust is the primary source of CO. In an urban setting, the highest CO concentrations are generally found near congested intersections. Under typical meteorological conditions, CO concentrations tend to decrease as distance from the emissions source (i.e., congested intersection) increase. Project-generated traffic has the potential of contributing to localized “hot spots” of CO off-site. Because CO is a byproduct of incomplete combustion, exhaust emissions are worse when fossil-fueled vehicles are operated inefficiently, such as in stop-and-go traffic or through heavily congested intersections, where the level of service (LOS) is severely degraded.

CARB recommends evaluation of the potential for the formation of locally high concentrations of CO, known as CO hot spots. A CO hot spot is a localized concentration of CO that is above the state or national 1-hour or 8-hour CO ambient air standards. To verify that the project would not cause or contribute to a violation of the 1-hour and 8-hour CO standards, an evaluation of the potential for CO hot spots at nearby intersections was conducted.

The TIA (LLG Engineers 2021) evaluated whether there would be a change in the LOS at the intersections affected by the proposed project. In accordance with the Transportation Project-Level Carbon Monoxide Protocol, CO hot spots are typically evaluated when: (a) the LOS of an intersection decreases to a LOS E or worse because of the project; (b) signalization and/or channelization is added to an intersection; and (c) sensitive receptors such as residences, schools, hospitals, etc., are located in the vicinity of the affected intersection or roadway segment (California Department of Transportation [Caltrans] 1998).

According to the TIA, all of the analyzed intersections are forecast to operate at LOS D or better in the project opening year condition, without implementation of the project. Implementation of the project would not result in the LOS of any of the analyzed intersections degrading to LOS E or F (LLG Engineers 2021). Therefore, consistent with the CO Protocol, operation of the project would not result in exposure of sensitive receptors to substantial localized CO concentrations.

New Sensitive Receptors

As a residential development, the project would site new sensitive receptors. The CARB siting recommendations within the Air Quality and Land Use Handbook suggest a detailed health risk

assessment should be conducted for proposed sensitive receptors within 1,000 feet of a warehouse distribution center, within 500 feet of a freeway or urban road with 100,000 vehicles per day, within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater), 50 feet of a typical gas dispensing facilities or within 300 feet of a dry cleaning facility that uses perchloroethylene (PCE), among other siting recommendations (CARB 2005). There are no facilities of this type within 1,000 feet of the project site. The closest high-volume roadway, State Route 71, only carries 75,000 average daily trips along the segment adjacent the project site (Caltrans 2022). Future project residents would not be exposed to substantial concentrations of TACs from existing sources.

5.3.2 Significance of Impacts

Construction of the project would not result in exposure of sensitive receptors to substantial localized concentrations of criteria pollutants and precursors.

Construction DPM emissions would not exceed the SCAQMD threshold for a maximum non-cancer chronic health index of 1. However, the incremental increased cancer risk would exceed the SCAQMD threshold of 10 in 1 million. Therefore, construction of the project would result in a potentially significant impact related to the exposure of sensitive receptors to substantial DPM concentrations.

Operation of the project would not result in exposure of sensitive receptors to substantial localized CO concentrations. Future project residents would not be exposed to substantial concentrations of TACs from existing sources.

5.3.3 Mitigation Framework

Mitigation measure AQ-1 would be required to reduce emissions of onsite DPM during project construction.

5.3.4 Significance After Mitigation

As shown in Table 17, *Mitigated Health Risk Summary*, with incorporation of mitigation measure AQ-1, the health risk exposure at the PMI would be reduced to a residential incremental cancer risk of 1.33 in 1 million and a residential non-cancer chronic maximum hazard index of 0.0008. Cancer risk at the MEIR would be reduced to 0.68 in 1 million and the chronic hazard index would be reduced to 0.0004 with incorporation of mitigation measure AQ-1.

Table 17
MITIGATED HEALTH RISK SUMMARY

Receptor Description	Residential Cancer Risk[1]	Noncancer Chronic[2]
PMI	1.33	0.0008
MEIR	0.68	0.0004

Source: ADMRT (output data is provided in Appendix B)

[1] Risk in increased chances per million.

[2] Hazard Index.

Therefore, with implementation of mitigation measure AQ-1, emissions of construction period DPM would not result in exceedances of the SCAQMD thresholds for residential incremental cancer risk or

non-cancer chronic hazard. Impacts related to exposure of sensitive receptors to substantial DPM concentrations would be less than significant with mitigation.

5.4 ISSUE 4: OTHER EMISSIONS (SUCH AS THOSE LEADING TO ODORS)

5.4.1 Impacts

According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting activities, refineries, landfills, dairies, and fiberglass molding operations (SCAQMD 1993). The residential project would not include any of these uses nor are there any of these land uses in the project vicinity.

Emissions from construction equipment, such as diesel exhaust, and VOCs from architectural coatings and paving activities may generate odors; however, these odors would be temporary, intermittent, and not expected to affect a substantial number of people. Additionally, noxious odors would be confined to the immediate vicinity of construction equipment. By the time such emissions reach any sensitive receptor sites, they would be diluted to well below any level of air quality concern. Furthermore, short-term construction-related odors are expected to cease upon the drying or hardening of the odor-producing materials. Long-term operation of the project would not be a substantial source of objectionable odors. Therefore, the project would not create objectionable odors affecting a substantial number of people, and the impact would be less than significant.

5.4.2 Significance of Impacts

Implementation of the project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people, and the impact would be less than significant.

5.4.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

5.4.4 Significance After Mitigation

Implementation of the project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people, and the impact would be less than significant.

6.0 GREENHOUSE GAS IMPACT ANALYSIS

This section evaluates potential impacts of the proposed project related to the generation of GHG emissions. Complete modeling results are included as Appendix A of this report.

6.1 ISSUE 1: GREENHOUSE GAS EMISSIONS

6.1.1 Construction Emissions

Project construction GHG emissions were estimated using CalEEMod as described in Section 4.1. Project-specific input was based on general information provided in Section 1.0 and default model settings to estimate reasonably conservative conditions. Additional details of phasing, selection of construction equipment, and other input parameters, including CalEEMod data, are included in Appendix A.

Emissions of GHGs related to the construction of the project would be temporary. As shown in Table 18, *Estimated Construction Greenhouse Gas Emissions*, total GHG emissions associated with construction of the project are estimated at 2,065 MT CO_2e. For construction emissions, SCAQMD guidance recommends that the emissions be amortized (i.e., averaged) over 30 years and added to operational emissions. Averaged over 30 years, the proposed construction activities would contribute approximately 69 MT CO_2e emissions per year.

Table 18
ESTIMATED CONSTRUCTION GREENHOUSE GAS EMISSIONS

Activity	Emissions (MT CO_2e)
Demolition	53.94
Site Preparation	20.39
Grading	1,235.92
Paving	54.14
Building Construction	690.59
Architectural Coating	10.50
TOTAL[1]	**2,065.48**
Amortized Construction Emissions[2]	***68.85***

Source: CalEEMod (output data is provided in Appendix A)
[1] Totals may not sum due to rounding.
[2] Construction emissions are amortized over 30 years in accordance with SCAQMD guidance.
GHG = greenhouse gas; MT = metric tons; CO_2e = carbon dioxide equivalent

6.1.2 Operational Emissions

Table 19, *Total Operational Greenhouse Gas Emissions*, shows the calculated total annual emissions for the project. The emissions include the amortized annual construction emissions anticipated for the project. Appendix A contains the CalEEMod output files for the project.

Table 19
TOTAL OPERATIONAL GREENHOUSE GAS EMISSIONS

Emission Sources	2025 Emissions (MT CO_2e)
Area Sources	2.74
Energy Sources	281.62
Vehicular (Mobile) Sources	2,429.33
Solid Waste Sources	73.59
Water Sources	41.21
Subtotal[1]	**2,828.49**
Construction (Annualized over 30 years)	68.85
TOTAL[1]	**2,897.34**
SCAQMD GHG Threshold	**3,000**
Exceed Threshold?	**No**

Source: CalEEMod (output data is provided in Appendix A)
[1] Totals may not sum due to rounding.
[2] Emission per capita is the project total emissions divided by the project population (2,301.3/690).
GHG = greenhouse gas; MT = metric tons; CO_2e = carbon dioxide equivalent

As shown in Table 19, the project emissions are 2,897 MT CO_2e, while the SCAQMD GHG threshold is 3,000 MT CO_2e per year.

6.1.3 Significance of Impacts

Implementation of the project would not result in greenhouse gas emissions exceeding the SCAQMD significance threshold of 3,000 MT CO_2e, and the impact would be less than significant.

6.1.4 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

6.1.5 Significance After Mitigation

Implementation of the project would not result in greenhouse gas emissions exceeding the SCAQMD significance threshold of 3,000 MT CO2e, and the impact would be less than significant.

6.2 ISSUE 2: CONFLICT WITH APPLICABLE PLANS ADOPTED FOR THE PURPOSE OF REDUCING GREENHOUSE GAS EMISSIONS

6.2.1 Impacts

There are numerous State plans, policies, and regulations adopted for the purpose of reducing GHG emissions. The principal overall State plan and policy is AB 32, the California Global Warming Solutions Act of 2006. The quantitative goal of AB 32 is to reduce GHG emissions to 1990 levels by 2020. SB 32 would require further reductions of 40 percent below 1990 levels by 2030. Because the project's operational year is post-2020, the project aims to reach the quantitative goals set by SB 32. Statewide plans and regulations such as GHG emissions standards for vehicles (AB 1493), the LCFS, and regulations requiring an increasing fraction of electricity to be generated from renewable sources are being

implemented at the statewide level; as such, compliance at the project level is not addressed. Therefore, the proposed project would not conflict with those plans and regulations.

The project must also be constructed in accordance with the energy-efficiency standards, water reduction goals, and other standards contained in the 2019 Title 24 Part 6 Building Energy Efficiency Standards and Part 11 (CALGreen) Building Standards, including the requirement for onsite solar electricity generation.

As discussed in Section 2.2.5 the San Bernardino County Regional Greenhouse Gas Reduction Plan shows that the City will reduce its community GHG emissions to a level consistent with CARB's per capita GHG reduction target for 2030 through consistency with state mandates including the Pavley vehicle standards, the state's low carbon fuel standard, and the RPS. Therefore, through mandatory compliance with state GHG reduction measures, the project would be consistent with the San Bernardino County Regional Greenhouse Gas Reduction Plan.

6.2.2 Significance of Impacts

The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and the impact would be less than significant.

6.2.3 Mitigation Framework

Impacts would be less than significant; therefore, no mitigation measures are required.

6.2.4 Significance After Mitigation

The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and the impact would be less than significant.

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Appendix A

CalEEMod Output

Appendix B

Health Risk Assessment Modeling

Appendix C

Title 24 Solar Requirement Calculations