Harmony Grove Village South

Appendix H

Air Quality Analysis Report

for the

Draft Final Environmental Impact Report

PDS2015-GPA-15-002
PDS2015-SP-15-002
PDS-REZ-15-003
PDS2018-TM-5626
PDS2015-MUP-15-008
Log No.: PDS2015-ER-15-08-006

May 2018

Prepared for:
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HELIX
Environmental Planning

Harmony Grove Village South Project

Air Quality Analysis Report

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April 2017

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Harmony Grove Village South Project

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GLOSSARY OF TERMS AND ACRONYMS

$\mu g/m^3$	micrograms per cubic meter
ADT	average daily trips
AMSL	above mean sea level
ANFO	ammonium nitrate/fuel oil
APN	Assessor's Parcel Number
AQIA	Air Quality Impact Assessment
BMPs	best management practices
CAA	Clean Air Act (Federal)
CAAQS	California Ambient Air Quality Standard
CalEEMod	California Emission Estimator Model
CalEPA	California Environmental Protection Agency
CALINE4	California Line Source Dispersion Model (Version 4)
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act
CDPM	Construction Cancer Risk DPM
CEQA	California Environmental Quality Act
CO	carbon monoxide
County	County of San Diego
CPF	cancer potency factor
DPM	diesel particulate matter
DU	dwelling unit
g/L	grams per liter
gpd	gallons per day
H_2S	hydrogen sulfide
HGV	Harmony Grove Village
HI	hazard index
HQ	hazard quotient
I-15	Interstate 15
lbs	pounds
LOS	level of service
MEI	maximum exposed individual
mgd	million gallons per day
mph	miles per hour

GLOSSARY OF TERMS AND ACRONYMS (cont.)

NAAQS	National Ambient Air Quality Standard
NO	nitrogen oxide
NO_X	oxides of nitrogen
NO_2	nitrogen dioxide
O_3	Ozone
OEHHA	California Office of Environmental Health Hazard Assessment
Pb	lead
PM_{10}	respirable particulate matter (particulate matter with an aerodynamic diameter of 10 microns or less)
$PM_{2.5}$	fine particulate matter (particulate matter with an aerodynamic diameter of 2.5 microns or less)
ppb	parts per billion
ppm	parts per million
Project	Harmony Grove Village South
PVC	polyvinyl chloride
RAQS	San Diego County Regional Air Quality Strategy
REL	reference exposure levels
Roadway Model	Road Construction Emissions Model
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SCAQMD	South Coast Air Quality Management District
SDAB	San Diego Air Basin
SDAPCD	San Diego County Air Pollution Control District
SDG&E	San Diego Gas & Electric
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_X	oxides of sulfur
SO_2	sulfur dioxide
SPV	San Pasqual Valley
SR	State Route
TACs	Toxic Air Contaminants
T-BACT	Toxics Best Available Control Technology
TIA	Traffic Impact Analysis
TSP	total suspended particulate

GLOSSARY OF TERMS AND ACRONYMS (cont.)

VMT	vehicle miles traveled
VOCs	volatile organic compounds
WTWRF	wastewater treatment and water reclamation facility
WRCC	Western Regional Climate Center
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

This report presents an assessment of potential air quality impacts associated with the proposed Harmony Grove Village (HGV) South Project (Proposed Project or Project). The evaluation addresses the potential for air pollutant emissions during construction and after full buildout of the Project.

As discussed in Section 4.1.2, the Project would increase density in terms of the number of dwelling units (DUs) compared to what was assumed in the County of San Diego General Plan. This could create potential interference with the Regional Air Quality Strategy (RAQS) and, therefore, Project-level and cumulative impacts would be significant.

The Project would result in emissions of air pollutants during both the construction phase and operational phase of the Project. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment, and construction workers commuting to and from the site. The Project would incorporate measures to minimize fugitive dust control emissions, including watering twice per day during grading and stabilization of storage piles. Construction is assumed to begin in 2018 and last approximately three years. With implementation of Project design features and construction best management practices (BMPs), short-term impacts associated with construction activities would be less than significant.

The main operational emissions associated with the Project would include impacts associated with vehicular traffic, as well as area sources such as energy use, landscaping, and the use of consumer products. A wide range of current regulatory codes, Project design features, and other measures would be incorporated into the Proposed Project. The Project would incorporate energy-efficiency features that would meet 2016 California Title 24 Energy Efficiency Standards. The installation of natural gas fireplaces would prevent residences from using wood as fuel for fire and prevent the generation of particulate emissions in the area. Emissions during operation of the Project would not exceed the daily screening level thresholds for any of the criteria pollutants. The Project would not result in cumulatively considerable emissions of nonattainment air pollutants that would exceed the screening level thresholds.

Quantitative screening-level health risk assessments were conducted to assess impacts to sensitive receptors from toxic air contaminants (TACs) during construction activities as well as operation of the wastewater treatment and water reclamation facility (WTWRF). Both construction and operation impacts were found to be less than significant.

The Project would not place sensitive receptors near major sources of air pollution or result in the exposure of sensitive receptors to substantial emissions of pollutants. Additionally, the Project would not result in the degradation of roadway intersections such that emissions of carbon monoxide (CO) would exceed state or federal standards that would result in a CO hotspot. An evaluation of potential odors from construction activities and Project operation indicated that the Project would not expose substantial numbers of people to objectionable odors.

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Purpose of The Report

This report analyzes potential air quality impacts associated with the proposed Harmony Grove Village (HGV) South Project (Proposed Project or Project), which includes an evaluation of existing conditions in the Project vicinity, an assessment of potential impacts associated with Project construction, and an evaluation of Project operational impacts. The analysis of impacts and report is prepared in accordance with the County of San Diego Guidelines for Determining Significance and Report Content and Format Requirement for Air Quality (County 2007).

1.2 Project Location and Description

The Project includes an approximately 111-acre site in an unincorporated portion of San Diego County (County) in the community of Harmony Grove (see Figure 1, *Regional Location Map*). The Project contains parcels with the following Assessor's Parcel Numbers (APNs): 235-011-06-00, 238-021-08-00, 238-021-09-00 and 238-021-10-00. The Project site is located approximately 2.5 miles west of Interstate 15 (I-15) and approximately 2.6 miles south of State Route 78 (SR 78). Escondido Creek flows east-west just north of the Project, and the City of Escondido is located to the east. The community of Elfin Forest is located to the west. County open-space parcels (the Del Dios Highland Preserve) abut the southern boundary of the Project. The western Project boundary abuts Country Club Drive. Primary access to the Project vicinity is provided by Harmony Grove Road and Country Club Drive (see Figure 2, *Project Vicinity Map*).

The Proposed Project would contain 453 residential units and a small commercial area with limited retail/commercial uses (the Center House). The total square footage of structures associated with the Center House use would be approximately 5,000 square feet, with a minimum of 500 square feet of commercial use. The residential units would be a mix of multi- and single-family units.

The Project design includes an on-site wastewater treatment and water reclamation facility (WTWRF) located in the northwestern portion of the site.[1] This facility would provide treatment for all wastewater generated on site, and would produce reclaimed effluent per applicable regulatory standards for irrigation of on-site landscaping. Based on the loading and design criteria used in the 180,000 gallons per day (gpd) Harmony Grove plant design that serves 1,951 residents, a scaled-down version could be constructed to serve the Proposed Project.

Two primary Project entries would be provided from Country Club Drive south of the Escondido Creek Crossing. The first would be located approximately one-quarter mile south of the intersection with Harmony Grove Road and would provide direct access to the destination gathering location and Paseo and Court housing. A second entrance would be located approximately 200 feet north of Cordrey Drive and would provide direct access to Project Compound and Villa housing.

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[1] As described in the Project EIR Chapter 4.0, Alternatives, alternative design scenarios were evaluated for the treatment of wastewater. Of the possible scenarios, the full on-site WTWRF proposed for the Project would result in the greatest emissions, and was therefore included in this analysis as a worst case.

1.3 Project Design Features and Best Management Practices

1.3.1 Regulatory Requirements

Construction Measures

The Project would incorporate best management practices (BMPs) during construction to reduce emissions of fugitive dust. SDAPCD Rule 55 – Fugitive Dust Control states that no dust and/or dirt shall leave the property line. SDAPCD Rule 55 requires the following:

1. **Airborne Dust Beyond the Property Line:** No person shall engage in construction or demolition activity subject to this rule in a manner that discharges visible dust emissions into the atmosphere beyond the property line for a period or periods aggregating more than 3 minutes in any 60-minute period.

2. **Track-Out/Carry-Out:** Visible roadway dust as a result of active operations, spillage from transport trucks, erosion, or track-out/carry-out shall:

    (i) be minimized by the use of any of the following or equally effective trackout/carry-out and erosion control measures that apply to the Project or operation:

    (a) track-out grates or gravel beds at each egress point;

    (b) wheel-washing at each egress during muddy conditions, soil binders, chemical soil stabilizers, geotextiles, mulching, or seeding; and for outbound transport trucks; and

    (c) using secured tarps or cargo covering, watering, or treating of transported material.

    (ii) be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations. If a street sweeper is used to remove any track-out/carry-out, only PM_{10}-efficient street sweepers certified to meet the most current South Coast Air Quality Management District (SCAQMD) Rule 1186 requirements shall be used. The use of blowers for removal of track-out/ carry-out is prohibited under any circumstances.

Area Source Reductions

- Use of low- volatile organic compound (VOC) coatings in accordance with, or exceeding, SDAPCD Rule 67
    - Residential interior coatings are to be less than or equal to 50 grams of VOC per liter (g/L)
    - Residential exterior coatings are to be less than or equal to 100 g/L
    - Non-residential interior/exterior coatings are to be less than or equal to 100 g/L

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Regional Location Map

HARMONY GROVE VILLAGE SOUTH

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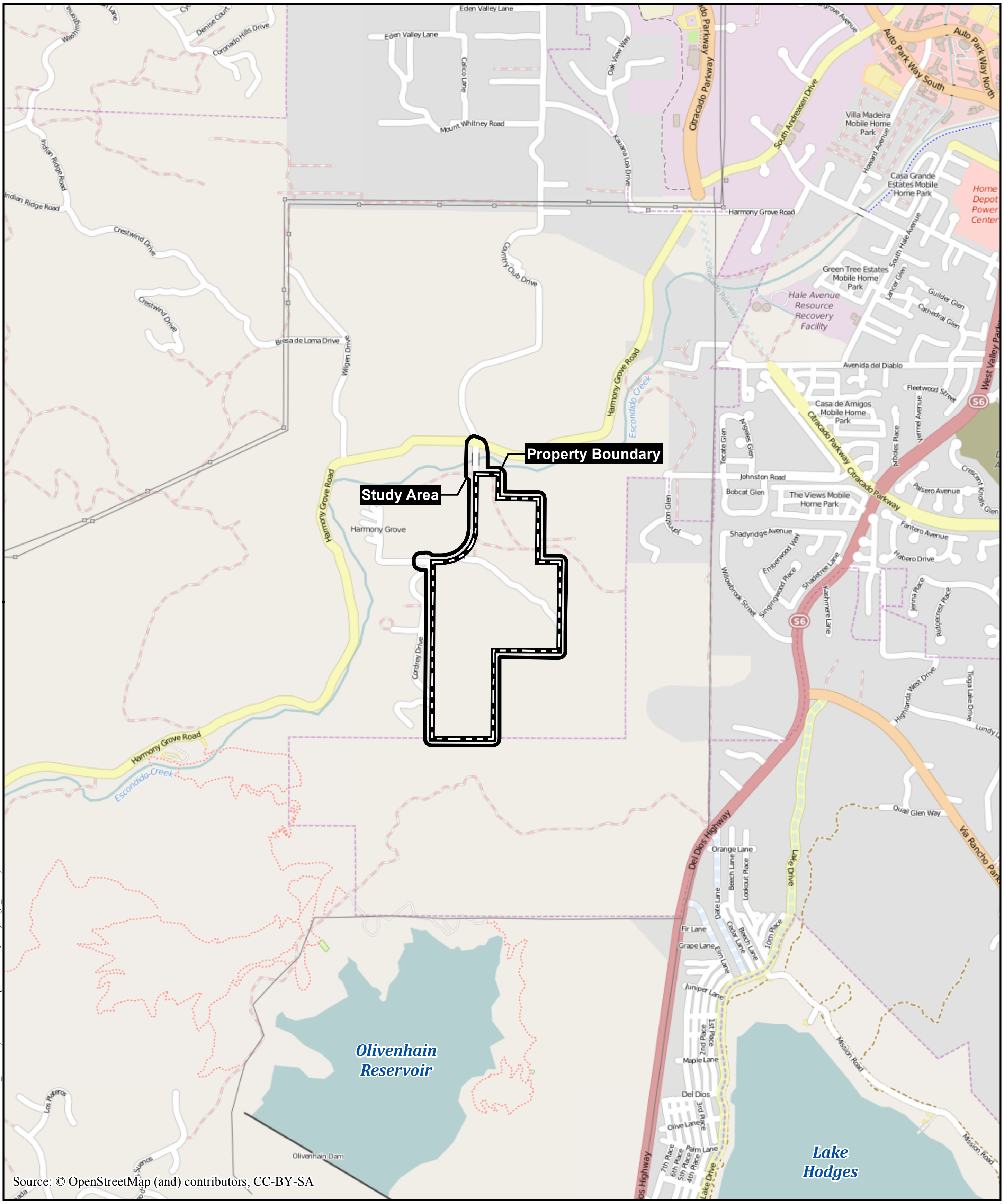
N 0 8 Miles

Figure 1



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Project Vicinity Map

HARMONY GROVE VILLAGE SOUTH

HELIX Environmental Planning

N 0 2,000 Feet

Figure 2

Energy Efficiencies

- The Project will be designed to meet 2016 Title 24 energy efficiency standards

1.3.2 Construction Best Management Practices

The control measures listed below are the BMPs that the Project would incorporate for dust control:

- The Project applicant will require the contractor(s) to implement paving, chip sealing or chemical stabilization of internal roadways after completion of grading.
- Dirt storage piles will be stabilized by chemical binders, tarps, fencing or other erosion control.
- A 15-mile per hour (mph) speed limit will be enforced on unpaved surfaces.
- On dry days, dirt and debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of particulate matter caused by vehicle movement. Approach routes to construction sites shall be cleaned daily of construction-related dirt in dry weather.
- Haul trucks hauling dirt, sand, soil, or other loose materials will be covered or two feet of freeboard will be maintained.
- Disturbed areas shall be hydroseeded, landscaped, or developed as quickly as possible and as directed by the County and/or SDAPCD to reduce dust generation.
- Grading will be terminated if winds exceed 25 mph.
- Any blasting areas would be wetted down prior to initiating the blast.
- In accordance with CALGreen criteria and state and local laws, at least 50 percent of on-site construction waste and ongoing operational waste would be diverted from landfills through reuse and recycling.

1.3.3 Project Design Features

In addition, the Project proposes design features which would reduce the operational emissions of criteria air pollutants associated with the Proposed Project. These design features would be included as building permit conditions and verified prior to the issuance of final certificate of occupancy. These include, but are not limited to, the following:

Area Source Reductions

- Only natural gas fireplaces are to be installed in residences, which would prevent residences from using wood as fuel for fire and prevent the generation of PM_{10} emissions in the area

Energy Efficiencies

- Renewable energy would supply 100 percent of the Project's electricity needs through the required installation of rooftop solar PV panels (a photovoltaic system) on all residential units, the Center House and WTWRF located within the Project site. As an alternative to the installation of PV panels on a particular building unit, enrollment in a renewables program similar to SDG&E's SunRate may be substituted if the program can be verified to supply 100 percent of the electricity needs from renewable sources for that building unit for the life of that unit. The applicant must provide the County with documentation that the program meets the requirements stated herein by supplying the building unit with its electricity needs from renewable sources over the lifetime of the building. With each building permit, the estimated number of units requiring the installation of solar panel will be provided to the County to determine the overall remaining number of units needed to comply with this measure.

- Installation of electrical outlets on the exterior walls of residences to promote the use of electric landscape maintenance equipment.

- Notices will be provided to homebuyers of incentive and rebate programs available through SDG&E or other providers that encourage the purchase of electric landscape maintenance equipment.

- Installation of an electric vehicle re-charging station in the parking area for the Center House.

WTWRF Odor Controls

If the on-site WTWRF option is chosen, the following Project design features will be included:

- As relevant, all WTWRF facilities will be designed to minimize odors, including the addition of water misting, chemical additives or activated carbon, as required.

- All WTWRF facilities would be covered or housed to avoid uncontrolled odor release.

- Active odor control units would be located to manage gases from the wet and solids stream treatment processes.

- A misting system with odor neutralizing liquids to break down the foul smelling chemical compounds in the biogases would be installed.

- Bio filters would be utilized to capture odor causing compounds in a media bed where they are oxidized by naturally occurring micro-organisms.

2.0 EXISTING CONDITIONS

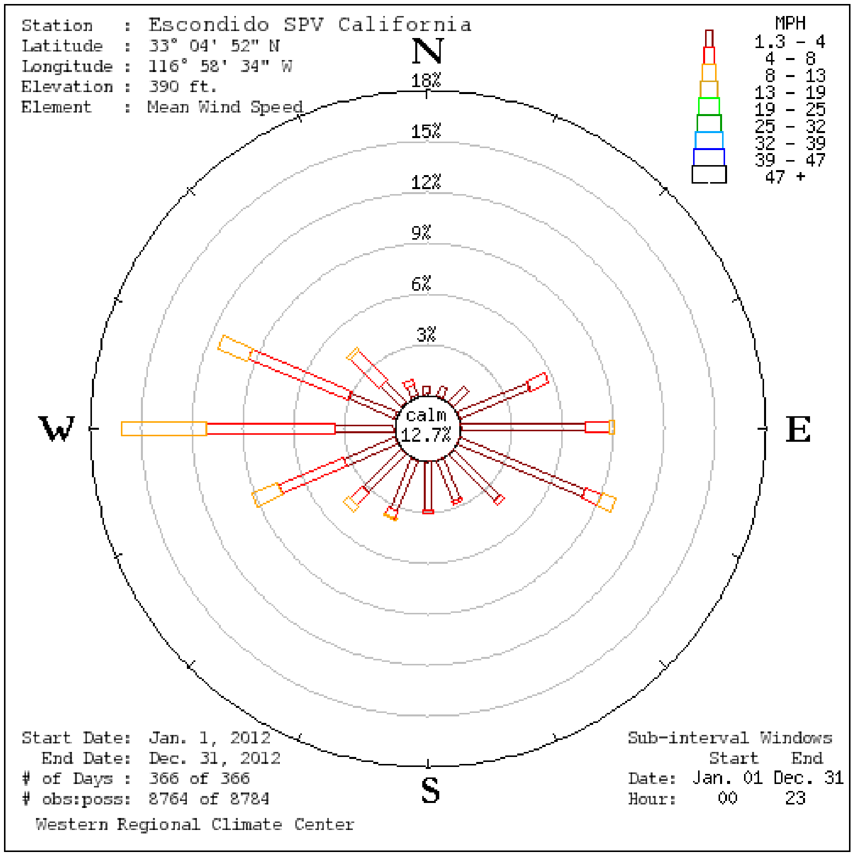
2.1 Existing Setting

The Project site is located west of I-15 and south of Harmony Grove Road in a semi-rural area, encompassing a mix of urban development and open space. The Project site consists of hilly terrain with elevations on the property ranging from approximately 570 to 938 feet above mean sea level (AMSL).

2.2 Climate / Meteorology and Temperature Inversions

The climate in southern California, including the San Diego Air Basin (SDAB) in which the Project site is located in, is controlled largely by the strength and position of the subtropical high-pressure cell over the Pacific Ocean. Areas within 30 miles of the coast experience moderate temperatures and comfortable humidity. Precipitation is limited to a few storms during the winter season. The climate of San Diego County is characterized by hot, dry summers, and mild, wet winters.

Figure 3, *Wind Rose – Escondido San Pasqual Valley (SPV) Monitoring Station*, presents a wind rose from the monitoring station for 2012, which is the closest monitoring station to the Project and represents general meteorological trends for the area. Wind monitoring data recorded at the Escondido SPV Monitoring Station indicated that the predominant wind direction in the vicinity of the Project site is from the west. Average wind speed in the vicinity is approximately four mph. The annual average temperature in the Project area is approximately 55 degrees Fahrenheit (°F) during the winter and approximately 74°F during the summer. Total precipitation in the Project area averages approximately 16.2 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer (Western Regional Climate Center [WRCC] 2014).



Source: WRCC 2014

Figure 3
Wind Rose – Escondido SPV Monitoring Station

The atmospheric conditions of the SDAB contribute to the region's air quality problems. The high-pressure cell also creates two types of temperature inversions that may act to degrade local air quality. Subsidence inversions occur during the warmer months as descending air associated with the Pacific high-pressure cell comes into contact with cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools through radiation and the air aloft remain warm. The shallow inversion layer formed between these two air masses can also trap pollutants.

Due to its climate, the SDAB experiences frequent temperature inversions. Typically, temperature decreases with height. However, under inversion conditions, temperature increases as altitude increases. Temperature inversions prevent air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are created due to the interaction between the ocean surface and the lower layer of the atmosphere, creating a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. Additionally, hydrocarbons and nitrogen dioxide (NO_2) react under strong sunlight, creating smog. Light, daytime winds, predominately from the west, further aggravate the condition by driving the air pollutants inland, toward the foothills. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and NO_2 emissions. High NO_2 levels usually occur during autumn or winter, on days with summer-like conditions.

High air pollution levels in coastal communities of San Diego often occur when polluted air from the South Coast Air Basin, particularly Los Angeles, travels southwest over the ocean at night, and is brought onshore into San Diego by the sea breeze during the day. Smog transported from the Los Angeles area is a key factor on more than 50 percent of the days San Diego exceeds clean air standards. Ozone (O_3) and precursor emissions are transported to San Diego during relatively mild Santa Ana weather conditions. However, during strong Santa Ana weather conditions, pollutants are pushed far out to sea and miss San Diego. When smog is blown in to the SDAB at ground level, the highest O_3 concentrations are measured at coastal and near-coastal monitoring stations. When the transported smog is elevated, coastal sites may be passed over, and the transported ozone is measured further inland and on the mountain slopes. Figure 3 provides a graphic representation of the prevailing winds in the Project vicinity, as measured at the Escondido SPV Monitoring Station. The high-pressure cell also creates two types of temperature inversions that may act to degrade local air quality.

2.3 AIR POLLUTANTS OF CONCERN

Criteria Air Pollutants

Federal and state laws regulate air pollutants emitted into the ambient air by stationary and mobile sources. These regulated air pollutants are known as “criteria air pollutants” and are categorized as primary and secondary standards. Primary standards are set of limits based on human health. Another set of limits intended to prevent environmental and property damage is called secondary standards. Criteria pollutants are defined by state and federal law as a risk to the health and welfare of the general public.

The following specific descriptions of health effects for each air pollutant associated with Project construction and operation are based on USEPA (USEPA 2007) and California Air Resources Board (CARB 2009).

Ozone. O_3 is considered a photochemical oxidant, which is a chemical that is formed when VOCs and oxides of nitrogen (NO_X), both by-products of fuel combustion, react in the presence of ultraviolet light. Ozone is considered a respiratory irritant and prolonged exposure can reduce lung function, aggravate asthma, and increase susceptibility to respiratory infections. Children and those with existing respiratory diseases are at greatest risk from exposure to ozone.

Carbon Monoxide. CO is a product of fuel combustion, and the main source of CO in the SDAB is from motor vehicle exhaust. CO is an odorless, colorless gas. CO affects red blood cells in the body by binding to hemoglobin and reducing the amount of oxygen that can be carried to the body’s organs and tissues. CO can cause health effects to those with cardiovascular disease, and can also affect mental alertness and vision.

Nitrogen Dioxide. NO_2 is also a by-product of fuel combustion, and is formed both directly as a product of combustion and in the atmosphere through the reaction of nitric oxide (NO) with oxygen. NO_2 is a respiratory irritant and may affect those with existing respiratory illness, including asthma. NO_2 can also increase the risk of respiratory illness.

Respirable Particulate Matter and Fine Particulate Matter. Respirable particulate matter, or PM_{10}, refers to particulate matter with an aerodynamic diameter of 10 microns or less. Fine particulate matter, or $PM_{2.5}$, refers to particulate matter with an aerodynamic diameter of 2.5 microns or less. Particulate matter in these size ranges has been determined to have the potential to lodge in the lungs and contribute to respiratory problems. PM_{10} and $PM_{2.5}$ arise from a variety of sources, including road dust, diesel exhaust, fuel combustion, tire and brake wear, construction operations and windblown dust. PM_{10} and $PM_{2.5}$ can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases such as asthma and chronic bronchitis. $PM_{2.5}$ is considered to have the potential to lodge deeper in the lungs.

Sulfur dioxide. Sulfur dioxide (SO_2) is a colorless, reactive gas that is produced from the burning of sulfur-containing fuels such as coal and oil, and by other industrial processes. Generally, the highest concentrations of SO_2 are found near large industrial sources. SO_2 is a respiratory irritant that can cause narrowing of the airways leading to wheezing and shortness of breath. Long-term exposure to SO_2 can cause respiratory illness and aggravate existing cardiovascular disease.

Lead. Lead (Pb) in the atmosphere occurs as particulate matter. Pb has historically been emitted from vehicles combusting leaded gasoline, as well as from industrial sources. With the phase-out of leaded gasoline, large manufacturing facilities are the sources of the largest amounts of lead emissions. Pb has the potential to cause gastrointestinal, central nervous system, kidney and blood diseases upon prolonged exposure. Pb is also classified as a probable human carcinogen.

Sulfates. Sulfates are the fully oxidized ionic form of sulfur. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features. The CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and due to fact that they are usually acidic, can harm ecosystems and damage materials and property.

Hydrogen Sulfide. Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation. Breathing H_2S at levels above the standard would result in exposure to a very disagreeable odor. In 1984, a CARB committee concluded that the ambient standard for H_2S is adequate to protect public health and to significantly reduce odor annoyance.

Vinyl Chloride. Vinyl chloride, a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants and hazardous waste sites, due to microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure to vinyl chloride through inhalation and oral exposure causes liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer, in humans.

Visibility-Reducing Particles. Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt. These particles in the atmosphere would obstruct the range of visibility. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze.

Toxic Air Contaminants

The public's exposure to toxic air contaminants (TACs) is a significant environmental health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. The Health and Safety Code (§39655, subd. [a].) defines a 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 USC Sec. 7412[b]) is a toxic air contaminant. 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.

Cancer Risk. One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens; that is, any exposure to a carcinogen poses some risk of causing cancer. Health statistics show that one in four people will contract cancer over their lifetime, or 250,000 in one million, from all causes, including diet, genetic factors, and lifestyle choices.

Noncancer Health Risks. Unlike carcinogens, it is believed that there is a threshold level of exposure to most noncarcinogens below which they will not pose a health risk. CalEPA and the California Office of Environmental Health Hazard Assessment (OEHHA) have developed reference exposure levels (RELs) for noncarcinogenic TACs that are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The non-cancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

2.4 Regulatory Setting

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 Federal 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 pollutants (called "criteria" pollutants, specifically, ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants in the atmosphere. Table 1, *Ambient Air Quality Standards,* shows the federal and state ambient air quality standards.

Table 1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone	1-Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.070 ppm (137 μg/m^3)		0.075 ppm (147 μg/m^3)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 μg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m^3		-		
Fine Particulate Matter ($PM_{2.5}$)[8]	24-Hour	-	-	35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	12 μg/m^3		
Carbon Monoxide (CO)	1-Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	-	Non-Dispersive Infrared Photometry (NDIR)
	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)		-	-	-
Nitrogen Dioxide (NO_2)[9]	1-Hour	0.18 ppm (339 μg/m^3)	Gas Phase Chemiluminescence	0.100 ppm (188 μg/m^3)	-	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)		0.053 ppm (100 μg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1-Hour	0.25 ppm (655 μg/m^3)	Ultraviolet Fluorescence	75 ppb (196 μg/m^3)	-	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method
	3-Hour	-		-	0.5 ppm (1300 μg/m^3)	
	24-Hour	0.04 ppm (105 μg/m^3)		0.14 ppm (365 μg/m^3) (for certain areas)[9]	-	
	Annual Arithmetic Mean	-		0.030 ppm (80 μg/m^3) (for certain areas)[9]	-	
Lead[11,12]	30-Day Average	1.5 μg/m^3	Atomic Absorption	-	-	-
	Calendar Quarter	-		1.5 μg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	-		0.15 μg/m^3		
Visibility Reducing Particles[13]	8-Hour	See footnote 12	Beta Attenuation and Transmittance through Filter Tape	**No Federal Standards**		
Sulfates	24-Hour	25 μg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24-Hour	0.01 ppm (26 μg/m^3)	Gas Chromatography			

Notes for Table 1:

[1] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact USEPA for further clarification and current federal policies.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

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

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

[7] Reference method as described by the USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.

[8] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM_{10} standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[9] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 and 0.100 ppm, respectively.

[10] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-hour average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards have are approved.

[11] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[12] The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[13] In 1989, the ARB converted both the general statewide 10-mile visibility standards and the Lake Tahoe 20-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Source: CARB June 4, 2013

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The CARB has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants through the California Clean Air Act of 1988 (CCAA), and also has established CAAQS for additional pollutants, including sulfates, H_2S, vinyl chloride and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant. On April 30, 2012, the SDAB was classified as a marginal nonattainment area for the 8-hour NAAQS for ozone (CARB 2015). The SDAB is an attainment area for the NAAQS for all other criteria pollutants. The SDAB currently falls under a national "maintenance plan" for CO, following a 1998 redesignation as a CO attainment area (SDAPCD 2010). The SDAB is currently classified as a nonattainment area under the CAAQS for ozone (serious nonattainment), PM_{10}, and $PM_{2.5}$ (CARB 2016b).

The CARB is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The SDAPCD is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County.

The SDAPCD and San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The SDAPCD 2016 Revisions to the RAQS was adopted by the SDAPCD Board in December 2016. The local RAQS, in combination with those from all other California nonattainment areas with serious (or worse) air quality problems, is submitted to the CARB, which develops the California State Implementation Plan (SIP).

The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and by the County as part of the development of the County's General Plan.

The SIP relies on the same information from SANDAG 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 (Table 2, *Federal and State Air Quality Designation*) for San Diego County is as follows:

Table 2
FEDERAL AND STATE AIR QUALITY DESIGNATION

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

Source: CARB 2016b and USEPA 2013

2.5 Background Air Quality

The SDAPCD operates a network of ambient air monitoring stations throughout the County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring station to the Project site is the Escondido East Valley Parkway Monitoring Station located at 600 East Valley Parkway in Escondido. Air quality data for this monitoring station is shown on Table 3, *Air Quality Monitoring Data.*

Because the Escondido East Valley Parkway monitoring station is located in an area where there is substantial traffic congestion, it is likely that pollutant concentrations measured at this monitoring station are higher than concentrations that would be observed or measured in the Project area, and would thus provide a conservative estimate of background ambient air quality. In particular, concentrations of CO at the Escondido monitoring station tend to be among the highest in the SDAB due to the fact that the monitor is located along East Valley Parkway in a congested area in downtown Escondido. The station sees higher concentrations of CO than have historically been measured elsewhere in San Diego County, and the background data are not likely to be representative of background ambient CO concentrations at the Project site due to the site's location in a less developed area.

Monitoring data at Escondido East Valley Parkway Monitoring Station have had acceptable levels of criteria air pollutants CO and NO_2 for the years 2013 to 2015. A violation of the state 1-hour standard for ozone occurred in 2014. Violations of the state 8-hour standards for ozone have occurred multiple times in 2013, 2014, and 2015, but only occurred for the federal standards in 2014. No state or federal violations of the daily PM_{10} standard occurred during 2014 and 2015; however, the state maximum daily standard was exceeded once in 2013. The federal daily $PM_{2.5}$ was exceeded once in both 2013 and 2014. The only annual average exceedances were the state PM_{10} standards in 2013 and 2014.

Table 3
AIR QUALITY MONITORING DATA

Air Pollutant	2013	2014	2015
Ozone			
Max 1-hour (ppm)	0.084	0.099	0.079
Days > CAAQS (0.09 ppm)	0	1	0
Max 8-hour (ppm)	0.075	0.080	0.071
Days > NAAQS (0.075 ppm)	0	5	0
Days > CAAQS (0.070 ppm)	4	8	3
Particulate Matter (PM_{10})			
Max Daily ($\mu g/m^3$)	82.0	44.0	31.0
Days > NAAQS (150 $\mu g/m^3$)	0	0	0
Days > CAAQS (50 $\mu g/m^3$)	1	0	0
Annual Average ($\mu g/m^3$)	23.2	21.6	17.5
Exceed CAAQS (20 $\mu g/m^3$)	Yes	Yes	No

Table 3 (cont.) AIR QUALITY MONITORING DATA			
Air Pollutant	**2013**	**2014**	**2015**
Particulate Matter ($PM_{2.5}$)			
Max Daily (µg/m^3)	56.3	77.5	29.4
Days > NAAQS (35 µg/m^3)	1	1	0
Annual Average (µg/m^3)	10.5	9.6	No Data
Exceed NAAQS (15 µg/m^3)	No	No	-
Exceed CAAQS (12 µg/m^3)	No	No	-
Nitrogen Dioxide (NO_2)			
Max 1-hour (ppm)	0.061	0.063	0.048
Days > NAAQS (0.10 ppm)	0	0	0
Days > CAAQS (0.18 ppm)	0	0	0
Annual Average (ppm)	0.013	0.011	No Data
Exceed NAAQS (0.053 ppm)	No	No	-
Exceed CAAQS (0.030 ppm)	No	No	-
Carbon Monoxide (CO)			
Max 8-hour (ppm)	2.3	1.9	1.9
Days > NAAQS (9.0 ppm)	0	0	0
Days > CAAQS (9.0 ppm)	0	0	0
Max 1-hour (ppm)	3.2	3.5	3.1
Days > NAAQS (35 ppm)	0	0	0
Days > CAAQS (20 ppm)	0	0	0

Sources: CARB 2016a (www.arb.ca.gov) (The Escondido-E Valley Parkway Monitoring Station was used for all pollutants except CO)
USEPA 2016 (http://www.epa.gov/airdata/ad_rep_con.html) (Used for CO)
Notes: > = exceeding; ppm = parts per million; µg/m^3 = micrograms per cubic meter;
Standard Mean = Annual Arithmetic Mean; No Data = Insufficient data available to determine the value.

3.0 SIGNIFICANCE CRITERIA AND ANALYSIS METHODOLOGIES

3.1 Significance Criteria

The County (2007) has approved guidelines for determining significance based on Appendix G.III of the State California Environmental Quality Act (CEQA) Guidelines, which provide guidance that a project would have a significant environmental impact if it would:

1. Conflict with or obstruct the implementation of the San Diego RAQS or applicable portions of the SIP;

2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;

3. Result in a cumulatively considerable net increase for which the SDAB is in non-attainment of NAAQS or CAAQS;

4. Expose sensitive receptors (including, but not limited to, residences, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations; and

5. Create objectionable odors affecting a substantial number of people.

To determine whether a project would (a) result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation, or (b) result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for ozone precursors, oxides of NO_X and VOCs, project emissions may be evaluated based on the quantitative emission thresholds established by the SDAPCD. As part of its air quality permitting process, the SDAPCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments (AQIAs). The County has also adopted the SCAQMD's screening threshold of 55 pounds per day or 10 tons per year as a significance threshold for $PM_{2.5}$.

For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a project's total emissions would not result in a significant impact to air quality. The screening thresholds are included in Table 4, *Screening-level Thresholds for Air Quality Impact Analysis*.

Table 4
SCREENING-LEVEL THRESHOLDS FOR AIR QUALITY IMPACT ANALYSIS

Pollutant	Total Emissions		
Construction Emissions (Pounds per Day)			
Respirable Particulate Matter (PM_{10})	100		
Fine Particulate Matter ($PM_{2.5}$)	55		
Oxides of Nitrogen (NO_X)	250		
Oxides of Sulfur (SO_X)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOCs)	75		
Operational Emissions			
	Pounds per Hour	**Pounds per Day**	**Tons per Year**
Respirable Particulate Matter (PM_{10})	---	100	15
Fine Particulate Matter ($PM_{2.5}$)	---	55	10
Oxides of Nitrogen (NO_X)	25	250	40
Oxides of Sulfur (SO_X)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	---	3.2	0.6
Volatile Organic Compounds (VOC)	---	75	13.7
Toxic Air Contaminant Emissions			
Excess Cancer Risk	1 in 1 million 10 in 1 million with T-BACT		
Non-Cancer Hazard	1.0		

Source: SDACPD Rule 20.2 and Rule 1210.
T-BACT = Toxics Best Available Control Technology

3.2 Methodology

The air quality impact analysis contained in this report was prepared in accordance with the methodologies provided by the County as included in the *Guidelines for Determining Significance and Report Format and Content Requirements for Air Quality* (County 2007).

Criteria pollutant and ozone precursor emissions from Project construction and operation are assessed using the California Emission Estimator Model (CalEEMod), Version 2013.2.2 (SCAQMD 2013). CalEEMod is a computer model developed by SCAQMD with the input of several air quality management and pollution control districts to estimate criteria air pollutant emissions from various urban land uses (SCAQMD 2013). CalEEMod has the ability to calculate both mobile (i.e., vehicular) and some area source or stationary sources of emissions. CalEEMod allows land use selections that include project land use types, sizes, and metric specifics.

The Project layout is shown on Figure 4, *Site Plan*. The "commercial" portion of the Project would include 5,000 square feet of small retail. The land use subtype used in the model for the retail portion of the Project was assumed to be retail – strip mall. This is considered to be a very conservative (worst-case) assumption as it represents a general neighborhood commercial land use that may attract trips as opposed to being a "pass-by" facility.

The Road Construction Emissions Model (Roadway Model) Version 7.1.5.1, developed by Sacramento Metropolitan Air Quality Management District (SMAQMD), was used in addition to CalEEMod due to the size of the proposed roadways. The Roadway Model is typically used for linear roadway-type construction projects (SMAQMD 2013) and may be used in conjunction with CalEEMod. Table 5, *Project Component Assumptions*, presents a summary of the land use data input values for CalEEMod and the Roadway Model.

Table 5
PROJECT COMPONENT ASSUMPTIONS

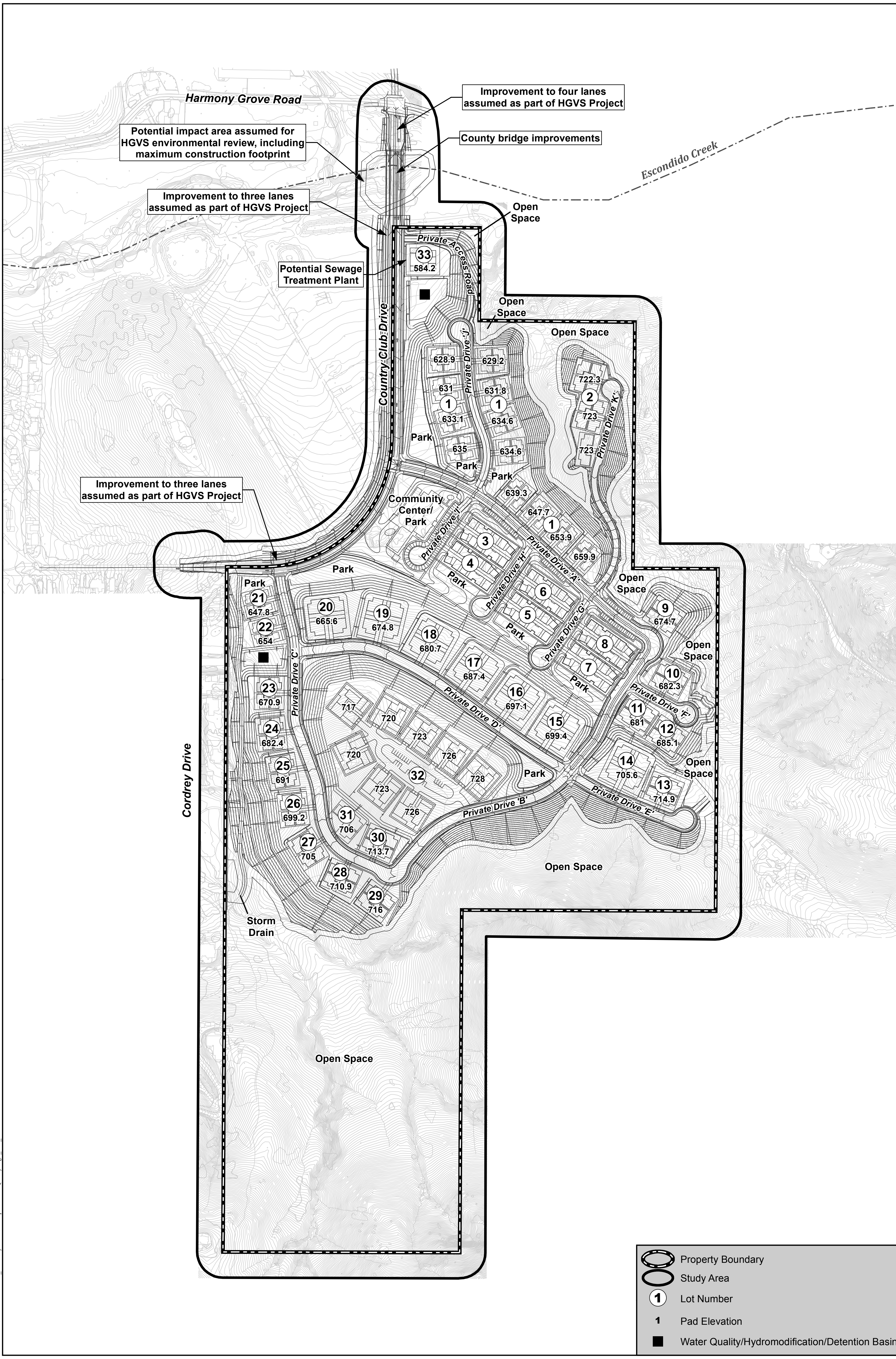
Land Use Type	Land Use Subtype	Size	Metric
Residential	Single Family Housing	193	Dwelling Unit
Residential	Multi-Family Housing	260	Dwelling Unit
Retail	Strip Mall	5	1,000 square feet
Roadway	New Road Construction	2.2	Miles
Parking	Center House Parking Lot	46	Spaces
Recreational	City Park	1.5	Acres

Construction Emissions. CalEEMod and the Roadway Model incorporate CARB's EMFAC2011 model for on-road vehicle emissions and the OFFROAD2011 model for off-road vehicle emissions (CARB 2012 and 2011). CalEEMod is designed to model construction emissions for land development projects while the Roadway Model is designed to model construction emissions for new or expanded roadway projects. Both models allow for the input of project-specific information, such as the number of equipment, hours of operations, duration of construction activities, and selection of emission control measures. The analysis assessed maximum daily emissions from individual construction activities, including site preparation, grading, backbone infrastructure, building construction, paving, and architectural coating. These are conservative assumptions, as they assume Project implementation of a bridge crossing of Escondido Creek, as well as upgrading Country Club Drive south of Harmony Grove Road with an additional travel lane.

Construction would require heavy equipment during mass grading, utility installations, building construction, and paving. Construction equipment estimates are based on default values in the Roadway Model and CalEEMod, as well as typical equipment used for the backbone infrastructure phase. Table 6, *Construction Equipment Assumptions*, presents a summary of the assumed equipment that would be involved in each stage of construction.

Table 6
CONSTRUCTION EQUIPMENT ASSUMPTIONS

Construction Phase	Equipment	Number
Site Prep and Blasting	Rubber Tired Dozers	3
	Tractors/Loaders/Backhoes	4
	Crushing/Proc. Equipment	1
Backbone Infrastructure	Forklift	1
	Off-Highway Truck	2
	Other Material Handling Equipment	1
	Tractors/Loaders/Backhoes	1
	Trenchers	1
Road Construction	Crawler Tractor	1
	Excavators	3
	Grader	1
	Roller	2
	Rubber Tired Loaders	1
	Scrapers	2
	Signal Boards	4
	Tractors/Loaders/Backhoes	2
Grading	Excavators	2
	Graders	1
	Rubber Tired Dozers	1
	Scrapers	2
	Tractors/Loaders/Backhoes	2
Bridge Construction	Cranes	2
	Forklift	1
	Tractors/Loaders/Backhoes	3
	Pumps	1
	Generators	2
Building Construction	Cranes	1
	Forklifts	3
	Generator sets	1
	Tractors/Loaders/Backhoes	3
	Welders	1



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Site Plan

HARMONY GROVE VILLAGE SOUTH

Figure 4

Table 6 (cont.) CONSTRUCTION EQUIPMENT ASSUMPTIONS		
Construction Phase	**Equipment**	**Number**
Parking Lot Paving	Pavers	2
	Paving Equipment	2
	Rollers	2
Architectural Coating	Air Compressors	1

Source: CalEEMod and Roadway Model (output data, including equipment horsepower, is provided in Appendix A).
Note: All equipment was assumed to operate 8 hours a day, with the exception of cranes and tractors/loaders/backhoes (7 hours per day) and air compressors (6 hours per day).

The construction schedule was determined by using CalEEMod defaults, input from the Project Applicant, and standard assumptions for similarly sized projects, taking into consideration the size of the Project in order to estimate necessary construction activities and length of days per construction activity. For example, a backbone infrastructure phase was added to the model to account for necessary Project trenching and utility installation. Roadway construction would occur during backbone infrastructure activity. As shown in Table 7, *Modeled Construction Schedule*, for the purposes of modeling Project development was assumed to start in July of 2018 and is projected to end in 2021, with some construction activities occurring sequentially (site preparation, backbone infrastructure, grading, building construction) and some simultaneously (backbone infrastructure and road construction; grading and bridge construction; bridge construction and building construction; paving, building construction and architectural coating). The quantity, duration, and the intensity of construction activity have an effect on the amount of construction emissions and their 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 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 incorporated in the CalEEMod, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval). A complete listing of the assumptions used in the analysis and model output is provided in Appendix A of this report.

Table 7 MODELED CONSTRUCTION SCHEDULE			
Construction Activity	Construction Period		
	Start	End	Number of Working Days
Site Preparation and Blasting	07/01/2018	09/30/2018	65
Backbone Infrastructure	10/01/2018	03/31/2019	130
Road Construction	10/01/2018	03/31/2019	130
Grading	04/01/2019	06/30/2019	65
Bridge Construction	04/01/2019	03/31/2020	260
Building Construction	07/01/2019	09/30/2021	588
Parking Lot Paving	05/01/2021	09/30/2021	109
Architectural Coating	05/01/2021	09/30/2021	109

Source: CalEEMod (output data is provided in Appendix A)

Although it was assumed that all of the dust control measures listed in Section 1.3 of this report would be implemented, to model the most conservative construction estimates, only application of water during grading and a 15-mph speed limit on unpaved surfaces was taken into consideration. Based on CalEEMod, Version 2013.2.2, the control efficiency for watering two times daily is 55 percent. The Project proposes balanced grading activity, which means that no soil would be transported off site for disposal nor would soil be transported on site for use in construction activities.

The Project would have to conform to the VOC limits included in SDAPCD Rule 67. According to Rule 67, residential interior coatings must have a VOC content less than or equal to 50 grams per liter (g/L), residential exterior coatings must have a content less than or equal to 100 g/L, and non-residential exterior and interior coatings must have a content less than or equal to 250 g/L. For modeling the Project's emissions in CalEEMod, conformance with these rules was assumed; however, non-residential coatings were assumed to be lower in VOC content than what is required (i.e., coatings with a VOC content less than or equal to 100 g/l). The quantities of coatings that would be applied to the interior and exterior of the new buildings were estimated according to CalEEMod default assumptions. A complete listing of the assumptions used in the analysis and model output is provided in Appendix A of this report.

Blasting may be required at the site during initial site preparation and grading activity. Blasting operations would be conducted through the use of drilling and blasting to fracture rocks. At this time the exact amount of blasting has not been determined, however, it is assumed that approximately two to three blasting events may occur each week. Blasting operations would be conducted by a licensed blasting contractor, in strict compliance with pertinent federal, state, and County requirements. All blasting materials would be transported to the site for each blasting sequence and no explosives would be stored at the site. A single drill rig would be used to drill a pattern of boreholes each with a 3- to 6-inch diameter. Several holes are drilled in an approximately 22,500 square-foot-area. Typically, the pattern is laid out in a 10-by-10 to 20-by-20-foot grid, with up to approximately 25-foot-deep holes. A contractor then loads the holes with carefully metered explosives. The "shot" is timed to detonate each hole(s) in sequence. This minimizes the ground vibration and noise of the blast, while maximizing fracture of the rock. Some dust is created as a result of the blast. However, the dust would be fully dissipated within 30 to 60 seconds following the shot. The rock would be broken up to sizes less than 18 inches in diameter.

Following blasting, the rock resource would be fractured and can be moved with conventional earthmoving equipment. A front-end loader would be used to spread the fractured rocks around the site for balanced cut/fill grading.

Fugitive dust emissions associated with blasting can be estimated based on the USEPA's emission factor for blasting for coal mining to remove overburden, which is a similar process. According to Section 11.9 of AP-42, emissions from blasting would be calculated as follows:

> Pounds (lbs) PM_{10}/blast = $0.000014(A)^{1.5}$ x 0.52 lbs PM_{10}/lbs total suspended particulates (TSP)
>
> Where:
>
> A is the area of blasting, which is approximately 22,500 square feet.

The Project would utilize ammonium nitrate/fuel oil (ANFO) explosives to conduct blasting on site. Based on the USEPA's AP-42 Section 13.3 emission factors, emissions from use of ANFO are estimated at 67 lbs CO per ton of explosive, and 17 lbs NO_X per ton of explosive. Based on typical construction projects, it was estimated that a maximum of 2,500 lbs/day (or 1.25 tons per day) could be used at the site.

Operational Emissions. The model estimates Project-generated, long-term regional area-source and mobile-source emissions of criteria air pollutants and ozone precursors. Operational emissions from area sources include the combustion of natural gas for heating and hot water, engine emissions from landscape maintenance equipment, and VOC emissions from repainting of buildings. Residential units would only have natural gas fireplaces.

Operational emissions from mobile source emissions are associated with Project-related vehicle trip generation. Based on the Traffic Impact Analysis (TIA; LLG 2017), at full buildout the Project would generate approximately 4,500 average daily trips (ADT).

CalEEMod default motor vehicle emission rates are based on CARB's EMFAC state-wide emission factors for the San Diego County region which are incorporated into CalEEMod. Default vehicle speeds, trip purpose, and trip type percentages for single-family homes were used. Average mobile trip lengths of 7.88 miles per trip were obtained from the Traffic Study – Average Trip Length memorandum (LLG 2016). Model output data sheets are included in Appendix A.

Wastewater Treatment and Water Reclamation Facility. As described previously in Section 1.2, Project Location and Description, the Project design includes a new stand-alone on-site Aeromod WTWRF that would provide treatment for all wastewater generated on site, and would produce reclaimed effluent per applicable regulatory standards for irrigation of on-site landscaping. Based on the loading and design criteria used in the 180,000-gpd HGV plant design, new treatment processes with similar tank sizes would be constructed at HGV South. A summary of major plant components includes the:

- Equalization basin to balance out variations in flow by storing a portion of the peak flows received for treatment in the plant during low-flow periods, and incorporating the headworks to provide fine screening of the influent wastewater.

- Secondary treatment areas to include aeration basins and anoxic basins performing the activated sludge process along with biological nitrogen removal as well as clarifier basins to settle most of the solids out of the wastewater to yield a clarified flow that goes to filters for further turbidity removal

- Filters for further removal of turbidity to produce reclaimed water meeting Title 22 standards for effluent clarity.

- Chlorine contact basins for disinfection of the reclaimed water by chlorine solution.

- Residual solids processing. The Aero-Mod process typically includes digester basins for further reduction of the settled solids produced by the treatment process.

- Equipment building, also providing space for employees to store their personal items, restrooms and showers for employees, some desk space and a small laboratory for use in operational control of the plant would be constructed on site.

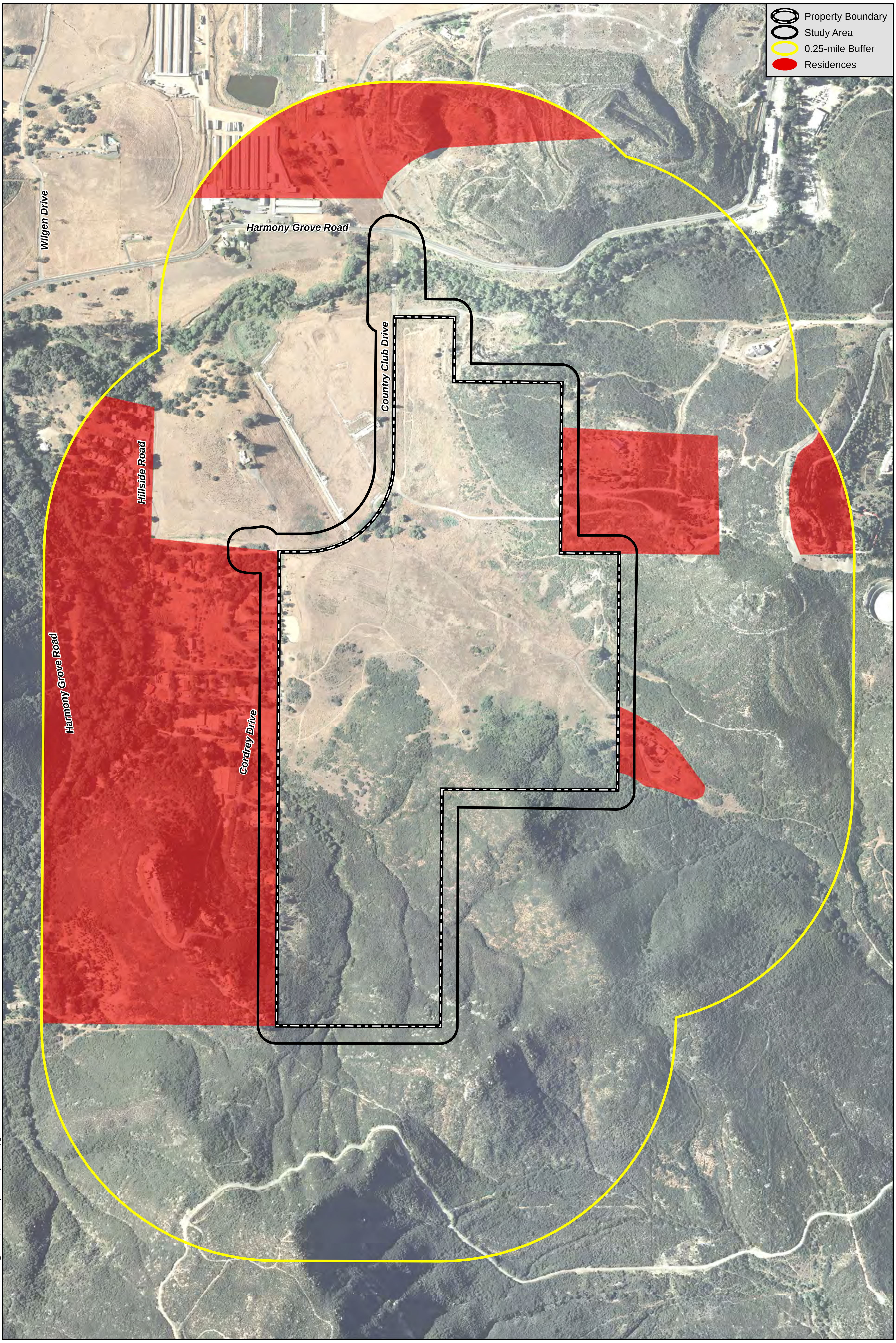
- Non-compliant effluent storage tanks.

Diesel-powered emergency generators would be used at the WTWRF for backup power during electric power failures. Generator emissions were estimated using CalEEMod. Emissions were calculated based on the annual testing frequency and duration and the power output of the engines. For the purposes of this analysis it was assumed that two 84 horsepower generators would operate for 8 hours per day, 260 days per year.

Location of Off-site Sensitive Receptors. Existing sensitive receptors within ¼ mile of the Project vicinity include scattered residences surrounding the Project vicinity in all directions with the highest density to the west. There are no hospitals or other non-residence sensitive receptors within ¼ mile of the Project site. Figure 5, *Location of Sensitive Receptors*, presents the location of sensitive receptors within ¼ mile of the Project site. As shown in Figure 5, the closest sensitive receptors include the residential uses to the west. The approved HGV project is currently under construction; consistent with the Project TIA, which assumes that project in place for traffic generation, residents are assumed to be present during the Proposed Project's initiation.

Carbon Monoxide Impacts at Congested Intersections. Localized CO concentrations at intersections that would result in a level of service (LOS) E or F due to the Project were estimated using the California Department of Transportation (Caltrans) California Line Source Dispersion Model (Version 4) (CALINE4) line source dispersion model. LOS is a measure of traffic delay, rated A-F, with F indicating the worst delay.

Health Risks from Diesel Particulate Matter and Volatile Organic Compounds. To evaluate whether Project construction activities and WTWRF could pose a significant impact to nearby



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Location of Sensitive Receptors

HARMONY GROVE VILLAGE SOUTH

HELIX Environmental Planning

N 0 500 Feet

Figure 5