Towne Centre View

AIR QUALITY IMPACT ANALYSIS

CITY OF SAN DIEGO

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JULY 5, 2022

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LIST OF ABBREVIATED TERMS

%	Percent
°F	Degrees Fahrenheit
(1)	Reference
µg/m^3	Microgram per Cubic Meter
AB	Assembly Bill
AB 2595	California Clean Air Act
AMSL	Above Mean Sea Level
AQIA	Air Quality Impact Analysis
AQMD	Air Quality Management District
AQP	Air Quality Plan
AQMP	Air Quality Management Plan
BAAQMD	Bay Area Air Quality Management District
CAA	Federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards Code
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CO	Carbon Monoxide
COHb	carboxyhemoglobin
City	City of San Diego
CY	Cubic Yards
DPM	Diesel Particulate Matter
EIR	Environmental Impact Reports
EMFAC	EMissions FACtor Model
EPA	Environmental Protection Agency
GFA	Gross Floor Area
GHG	Greenhouse Gas
H_2S	Hydrogen Sulfide
I-215	Interstate 215
lbs.	Pounds
lbs./day	Pounds Per Day
LST	Localized Significance Threshold
MWELO	Model Water Efficient Landscape Ordinance

MCAS	Marine Corp Air Station
N_2	Nitrogen
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
O_2	Oxygen
O_3	Ozone
Pb	Lead
PM_{10}	Particulate Matter 10 microns in diameter or less
$PM_{2.5}$	Particulate Matter 2.5 microns in diameter or less
ppm	Parts Per Million
Project	Menifee Crossroads
RECLAIM	Regional Clean Air Incentives Market
ROG	Reactive Organic Gases
Rule 51	Fugitive Dust
Rule 67.0.1	Architectural Coating
SDAB	San Diego Air Basin
SANDAG	San Diego Association of Governments
SDAPCD	South Coast Air Quality Management District
sf	Square Feet
SIPs	State Implementation Plans
SO_2	Sulfur Dioxide
SO_4	Sulfates
SO_X	Sulfur Oxides
SR	State Route
TAC	Toxic Air Contaminant
Title 24	California Building Code
C_2H_3Cl	Vinyl Chloride
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
vph	Vehicles Per Hour

EXECUTIVE SUMMARY

ES.1 SUMMARY OF FINDINGS

The results of this *Towne Centre View Air Quality Impact Analysis* (AQIA) are summarized below based on the significance criteria in Section 3 of this report consistent the California Environmental Quality Act (CEQA) Guidelines and the City of San Diego CEQA Significance Determination Thresholds (1) (2). Table ES-1 shows the findings of less than significant for each potential air quality impact under CEQA. As shown, no mitigation measures are required.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Air Quality Management Plan	3.4	*Less Than Significant*	*n/a*
Regional Construction Emissions	3.5	*Less Than Significant*	*n/a*
Regional Operational Emissions	3.6	*Less Than Significant*	*n/a*
Sensitive Receptors	3.7	*Less Than Significant*	*n/a*
CO "Hot Spot" Analysis	3.8	*Less Than Significant*	*n/a*
Odors	3.9	*Less Than Significant*	*n/a*
Cumulative Impacts	3.10	*Less Than Significant*	*n/a*

ES.2 STANDARD REGULATORY REQUIREMENTS/BEST AVAILABLE CONTROL MEASURES

There are numerous requirements that development projects must comply with by law, and that were put in place by federal, State, and local regulatory agencies for the improvement of air quality. The most pertinent regulatory requirements that apply to the proposed Project and which are required by San Diego Air Pollution Control District (SDAPCD) Rules that are currently applicable during construction activity for this Project include but are not limited to Rule 55 (Fugitive Dust) (3) and Rule 67.0.1 (Architectural Coatings) (4). Project compliance with these and other mandatory regulatory requirements were assumed in the analysis presented here.

SDAPCD RULE 51

This rule is intended to reduce nuisance associate with air pollution. Rule 51 applies to any activity capable of generating air contaminants except "odors emanating from agricultural operations in the growing of crops or raising of fowls or animals".

SDAPCD RULE 55

This rule is intended to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (human-made) fugitive dust sources by requiring actions to prevent and reduce fugitive dust emissions. Rule 55 applies to any activity or human-made condition capable of generating fugitive dust and requires best available control measures to be applied to earth moving and grading activities.

SDAPCD RULE 67.0.1

This rule serves to limit the VOC content of architectural coatings used on projects in the SDAPCD. Any person who supplies, sells, offers for sale, or manufactures any architectural coating for use on projects in the SDAPCD must comply with the current VOC standards set in this rule.

ES.3 CONSTRUCTION-SOURCE EMISSIONS MITIGATION MEASURES

The Project would not result in an exceedance of any regional or localized construction-source emissions thresholds. As such, the Project would not result in any significant impacts and no Mitigation Measure (MM) is required.

ES.4 OPERATIONAL-SOURCE EMISSIONS MITIGATION MEASURES

The Project would not result in an exceedance of any regional operational-source emissions thresholds. As such, the Project would not result in any significant impacts and no MMs are required.

1 INTRODUCTION

This report presents the results of the AQIA prepared by Urban Crossroads, Inc., for the proposed Towne Centre View Project (Project). The purpose of this AQIA is to evaluate the potential impacts to air quality associated with construction and operation of the proposed Project and, if warranted, recommend measures to mitigate impacts considered potentially significant in comparison to thresholds established by the SDAPCD. As concluded by this report, impacts would be less than significant and mitigation measures are not required.

1.1 SITE LOCATION

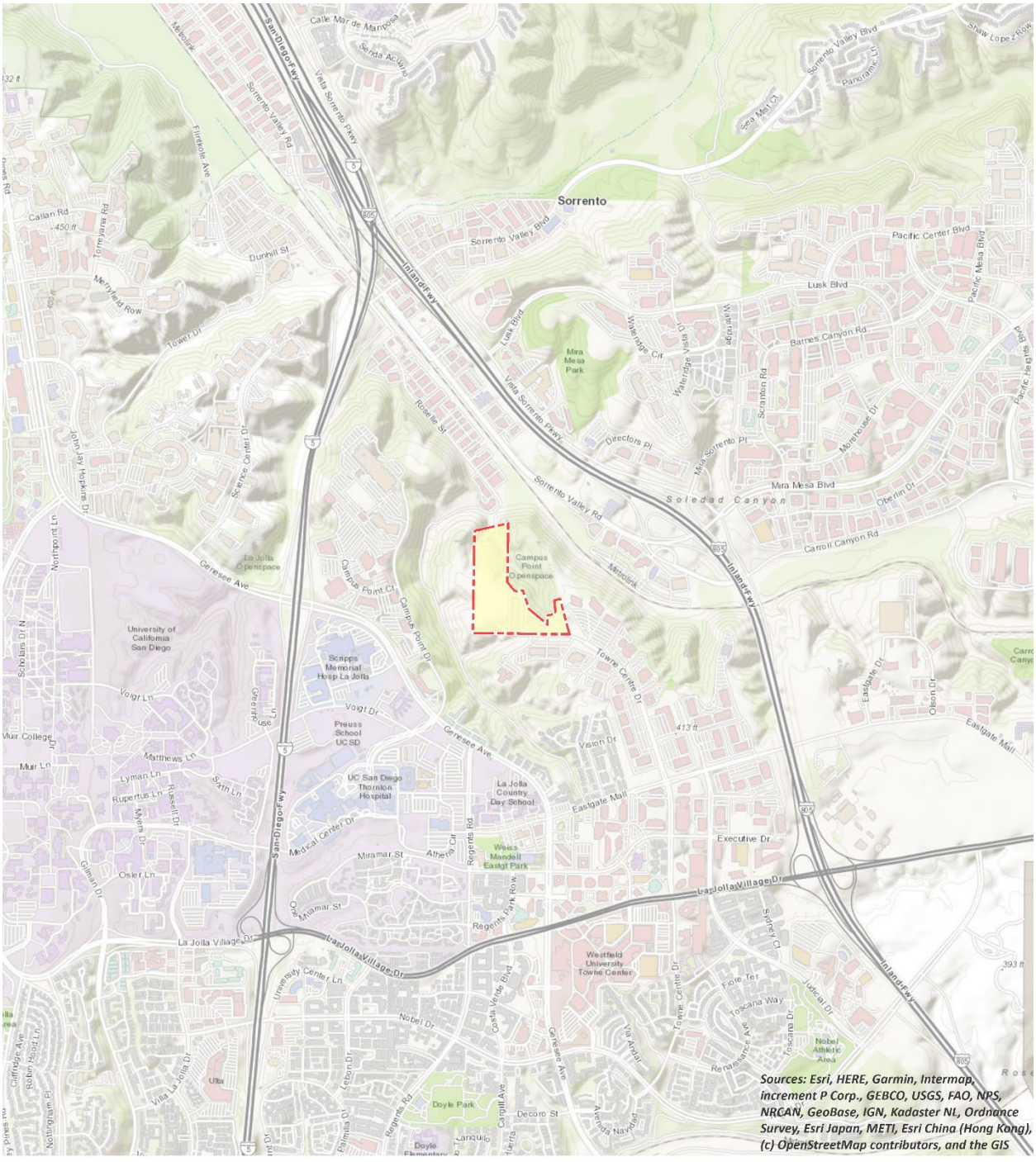
The proposed Towne Centre View site is located at the end Towne Centre Drive, as shown on Exhibit 1-A. The Project site is located north of the Eastgate Technology Park area and is designated Scientific Research land use in the University Community Plan (Subarea 11). Interstate (I) 805 is located approximately 1,500 feet east and I-5 is located approximately 2,900 feet west of the Project site. The eastern portion of the Project site is currently developed with 192,365 square feet (sf) of research and development and a 7,370-sf covered courtyard. Based on a review of historical aerial photographs, the existing land uses have been on-site since 2002 with one structure constructed in 2007. The western portion of the Project site is entitled for 190,000 sf of research and development (R&D) uses (pursuant to Coastal Development Permit 117798 and Site Development Permit 2758) and is currently being used as a staging area for the Mid-Coast Trolley construction. The nearest airport is the Marine Air Corps Station (MCAS) Miramar, which is located roughly 3 miles southeast of the Project site.

1.2 PROJECT DESCRIPTION

Exhibit 1-B illustrates the preliminary site plan. The Project involves redevelopment of the Project site with a five (5)-buildings campus. The proposed land uses include research, laboratory, technology, and office land uses. Buildings A through E would have a gross floor area (GFA) of 999,386 sf, with additional area consisting of balcony and roof deck space. A podium parking structure would be provided generally in the southern portion of the Project site (primarily subterranean under the proposed Buildings A through D), and a parking garage would be provided in the eastern portion of the Project site.

At the time this energy study was prepared, the future tenants of the proposed Project are unknown. This analysis is intended to describe energy usage associated with the expected typical operational activities at the Project site. The Project is anticipated to generate a net total of 6,461 trip-ends per day with 1,034 AM peak hour trips and 905 PM peak hour trips (5).

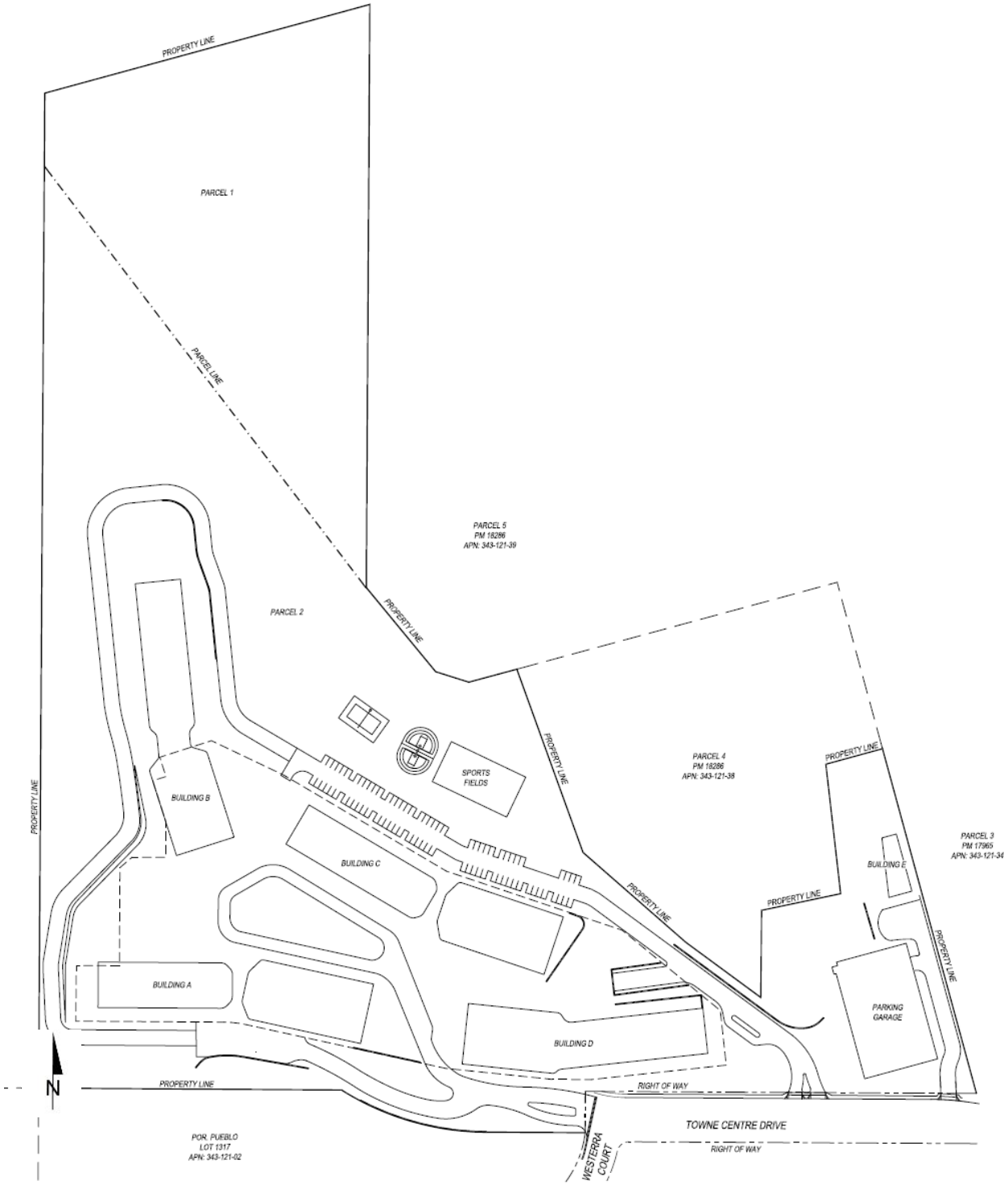
EXHIBIT 1-A: LOCATION MAP



N

LEGEND:
Site Boundary

EXHIBIT 1-B: SITE PLAN



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2 AIR QUALITY SETTING

This section provides an overview of the existing air quality conditions in the City and region.

2.1 SAN DIEGO AIR BASIN

The Project site is located approximately 2 miles east of the Pacific Ocean in San Diego County. San Diego County is within the San Diego Air Basin (SDAB), one of the 15 air basins that geographically divide the state of California (See Section 2.3.2.1). The eastern portion of the SDAB is surrounded by mountains to the north, east, and south. These mountains tend to restrict airflow and concentrate pollutants in the valleys and low-lying areas.

2.2 REGIONAL CLIMATE

The City, like the rest of San Diego County, has a Mediterranean climate characterized by warm, dry summers and mild winters. The mean annual temperature for the City is 63 degrees Fahrenheit (°F). The average annual precipitation is 13 inches, falling primarily from November to April. Winter low temperatures in the City average about 44°F, and summer high temperatures average about 80°F. The average relative humidity is 69% and is based on the yearly average humidity at Lindbergh Field (Western Regional Climate Center 2016).

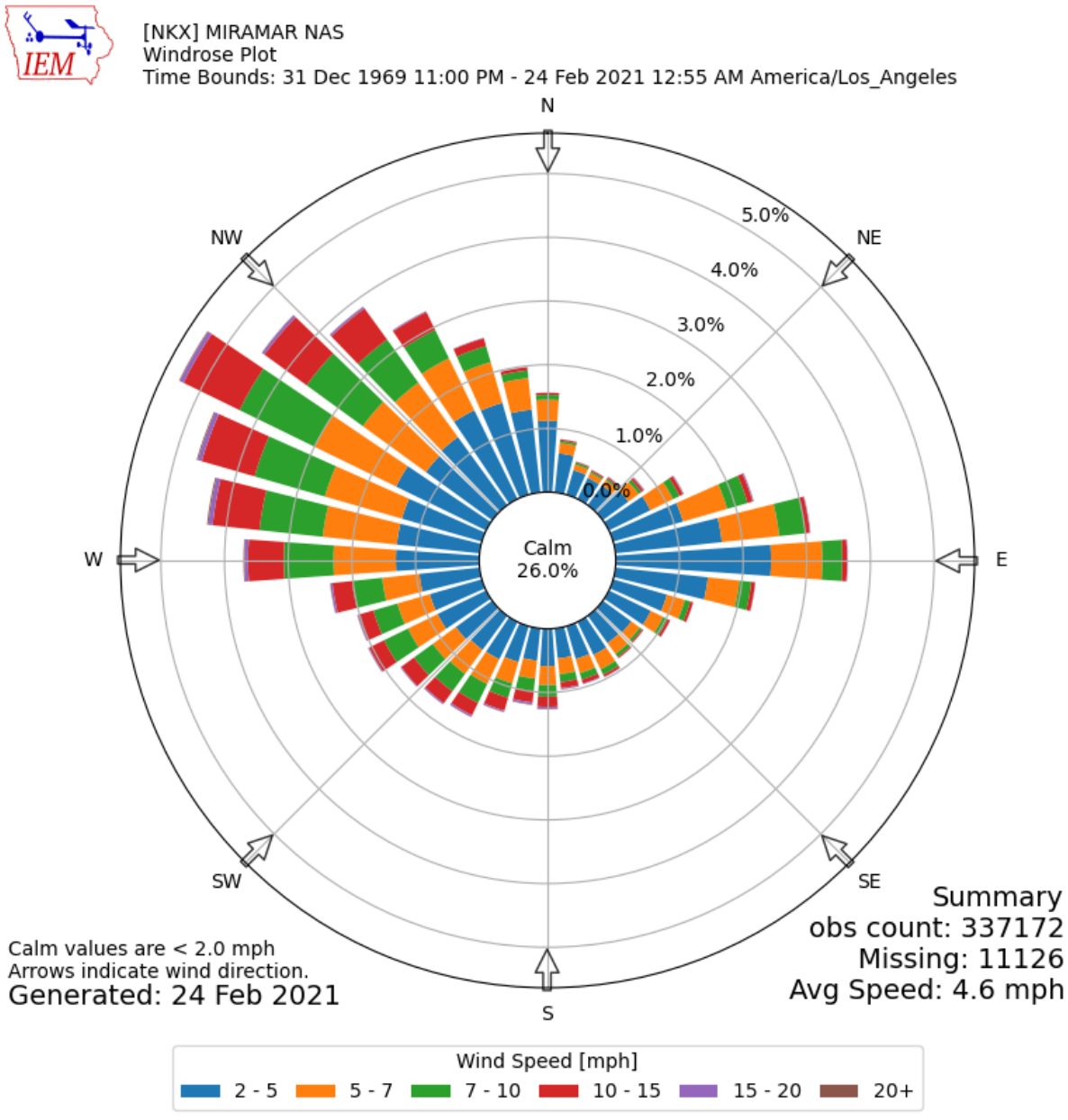
The dominant meteorological feature affecting the region is the Pacific High-Pressure Zone, which produces the prevailing westerly to northwesterly winds. These winds tend to blow pollutants away from the coast toward the inland areas. Consequently, air quality near the coast is generally better than that which occurs at the base of the coastal mountain range.

Fluctuations in the strength and pattern of winds from the Pacific High-Pressure Zone interacting with the daily local cycle produce periodic temperature inversions that influence the dispersal or containment of air pollutants in the SDAB. Beneath the inversion layer pollutants become “trapped” as their ability to disperse diminishes. The mixing depth is the area under the inversion layer. Generally, the morning inversion layer is lower than the afternoon inversion layer. The greater differences between the morning and afternoon mixing depths correspond to increased dispersion of pollutants in the atmosphere. Throughout the year, the height of the temperature inversion in the afternoon varies between approximately 1,500 and 2,500 feet above mean sea level (AMSL). In the winter, the morning inversion layer is about 800 feet AMSL. In the summer, the morning inversion layer is about 1,100 feet AMSL. Therefore, air quality generally tends to be better in the winter than in the summer.

The prevailing westerly wind pattern is sometimes interrupted by regional “Santa Ana” conditions. A Santa Ana occurs when a strong high pressure develops over the Nevada-Utah area and overcomes the prevailing westerly coastal winds, sending strong, steady, hot, dry northeasterly winds over the mountains and out to sea. Strong Santa Ana winds tend to blow pollutants out over the ocean, producing clear days. However, at the onset or during breakdown of these conditions, or if the Santa Ana is weak, local air quality may be adversely affected. In these cases, emissions from the South Coast Air Basin to the north are blown out over the ocean, and low pressure over Baja California, Mexico, draws this pollutant-laden air mass southward. As

the high pressure weakens, prevailing northwesterly winds reassert themselves and send this cloud of contamination ashore in the SDAB. When this event does occur, the combination of transported and locally produced contaminants produce the worst air quality measurements recorded in the basin. Exhibit 2-A presents a summary a diagram showing the relative frequency of wind directions as reported by the nearest meteorological station at MCAS Miramar since December 31, 1969 (6).

EXHIBIT 2-A: WIND ROSE FOR METEOROLOGICAL STATION MIRAMAR NAS



2.3 CRITERIA POLLUTANTS

Criteria pollutants are pollutants that are regulated through the development of human health based and/or environmentally based criteria for setting permissible levels. Criteria pollutants, their typical sources, and health effects are identified in Table 2-1 (7):

TABLE 2-1: CRITERIA POLLUTANTS

Criteria Pollutant	Description	Sources	Health Effects
Carbon Monoxide (CO)	CO is a colorless, odorless gas produced by the incomplete combustion of carbon-containing fuels, such as gasoline or wood. CO concentrations tend to be the highest during the winter morning, when little to no wind and surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines, unlike ozone (O_3), motor vehicles operating at slow speeds are the primary source of CO in the SDAB. The highest ambient CO concentrations are generally found near congested transportation corridors and intersections.	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.	Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of decreased oxygen (O_2) supply to the heart. Inhaled CO has no direct toxic effect on the lungs but exerts its effect on tissues by interfering with O_2 transport and competing with O_2 to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for O_2 supply can be adversely affected by exposure to CO. Individuals most at risk include fetuses, patients with diseases involving heart and blood vessels, and patients with chronic hypoxemia (O_2 deficiency) as seen at high altitudes.
Sulfur Dioxide (SO_2)	SO_2 is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high sulfur-content fuel oils and coal and from chemical processes occurring at chemical plants and refineries. When SO_2 oxidizes in the atmosphere, it forms SO_4.	Coal or oil burning power plants and industries, refineries, diesel engines	A few minutes of exposure to low levels of SO_2 can result in airway constriction in some asthmatics, all of whom are sensitive to its effects. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe

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	Collectively, these pollutants are referred to as sulfur oxides (SO_X).		breathing difficulties, are observed after acute exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2. Animal studies suggest that despite SO_2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically, or one pollutant alone is the predominant factor.
Nitrogen Dioxide (NO_X)	NO_X consist of nitric oxide (NO), nitrogen dioxide (NO_2) and nitrous oxide (N_2O) and are formed when nitrogen (N_2) combines with O_2. Their lifespan in the atmosphere ranges from one to seven days for nitric oxide and nitrogen dioxide, to 170 years for nitrous oxide. NO_X is typically created during combustion processes and are	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.	Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposure to NO_2 at levels found in homes with gas stoves, which are higher than ambient levels found in

TABLE 2-1: CRITERIA POLLUTANTS

Criteria Pollutant	Description	Sources	Health Effects
	major contributors to smog formation and acid deposition. NO_2 is a criteria air pollutant and may result in numerous adverse health effects; it absorbs blue light, resulting in a brownish-red cast to the atmosphere and reduced visibility. Of the seven types of nitrogen oxide compounds, NO_2 is the most abundant in the atmosphere. As ambient concentrations of NO_2 are related to traffic density, commuters in heavy traffic may be exposed to higher concentrations of NO_2 than those indicated by regional monitoring station.		Southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. In animals, exposure to levels of NO_2 considerably higher than ambient concentrations result in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of O_3 exposure increases when animals are exposed to a combination of O_3 and NO_2.
Ozone (O_3)	O_3 is a highly reactive and unstable gas that is formed when VOCs and NO_X, both byproducts of internal combustion engine exhaust, undergo slow photochemical reactions in the presence of sunlight. O_3 concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable to the formation of this pollutant.	Formed when reactive organic gases (ROG) and NO_X react in the presence of sunlight. ROG sources include any source that burns fuels, (e.g., gasoline, natural gas, wood, oil) solvents, petroleum processing and storage and pesticides.	Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible sub-groups for O_3 effects. Short-term exposure (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung

TABLE 2-1: CRITERIA POLLUTANTS

Criteria Pollutant	Description	Sources	Health Effects
			tissue, and some immunological changes. Elevated O_3 levels are associated with increased school absences. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple outdoor sports and live-in communities with high O_3 levels. O_3 exposure under exercising conditions is known to increase the severity of the responses described above. Animal studies suggest that exposure to a combination of pollutants that includes O_3 may be more toxic than exposure to O_3 alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.
Particulate Matter (PM)	PM_{10}: A major air pollutant consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and aerosols. Particulate matter pollution is a major cause of reduce visibility (haze) which is caused by the scattering of light and consequently the significant reduction air clarity. The size of the particles (10 microns or smaller, about 0.0004 inches or less) allows them to easily enter	Sources of PM_{10} include road dust, windblown dust and construction. Also formed from other pollutants (acid rain, NO_X, SO_X, organics). Incomplete combustion of any fuel. $PM_{2.5}$ comes from	A consistent correlation between elevated ambient fine particulate matter (PM_{10} and $PM_{2.5}$) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various

TABLE 2-1: CRITERIA POLLUTANTS

Criteria Pollutant	Description	Sources	Health Effects
	the lungs where they may be deposited, resulting in adverse health effects. Additionally, it should be noted that PM_{10} is considered a criteria air pollutant. $PM_{2.5}$: A similar air pollutant to PM_{10} consisting of tiny solid or liquid particles which are 2.5 microns or smaller (which is often referred to as fine particles). These particles are formed in the atmosphere from primary gaseous emissions that include SO_4 formed from SO_2 release from power plants and industrial facilities and nitrates that are formed from NO_X release from power plants, automobiles, and other types of combustion sources. The chemical composition of fine particles highly depends on location, time of year, and weather conditions. $PM_{2.5}$ is a criteria air pollutant.	fuel combustion in motor vehicles, equipment, and industrial sources, residential and agricultural burning. Also formed from reaction of other pollutants (acid rain, NO_X, SO_X, organics).	areas around the world. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in lifespan, and an increased mortality from lung cancer. Daily fluctuations in $PM_{2.5}$ concentration levels have also been related to hospital admissions for acute respiratory conditions in children, to school and kindergarten absences, to a decrease in respiratory lung volumes in normal children, and to increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long term exposure to particulate matter. The elderly, people with pre-existing respiratory or cardiovascular disease, and children appear to be more susceptible to the effects of high levels of PM_{10} and $PM_{2.5}$.
Volatile Organic Compounds (VOC)	VOCs are hydrocarbon compounds (any compound containing various combinations of hydrogen and carbon atoms) that exist in the ambient air. VOCs contribute to the formation of smog through atmospheric photochemical reactions and/or may be toxic. Compounds of carbon (also known as organic compounds) have different levels of reactivity; that is, they do not react at the same speed or do not form O_3 to the same extent when exposed to photochemical	Organic chemicals are widely used as ingredients in household products. Paints, varnishes, and wax all contain organic solvents, as do many cleaning, disinfecting, cosmetic, degreasing and hobby products. Fuels are made up of organic	Breathing VOCs can irritate the eyes, nose, and throat, can cause difficulty breathing and nausea, and can damage the central nervous system as well as other organs. Some VOCs can cause cancer. Not all VOCs have all these health effects, though many have several.

TABLE 2-1: CRITERIA POLLUTANTS

Criteria Pollutant	Description	Sources	Health Effects
	processes. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints. Exceptions to the VOC designation include CO, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate. VOCs are a criteria pollutant since they are a precursor to O_3, which is a criteria pollutant. The terms VOC and ROG (see below) interchangeably.	chemicals. All of these products can release organic compounds while you are using them, and, to some degree, when they are stored.	
Reactive Organic Compounds (ROG)	Similar to VOC, ROGs are also precursors in forming O_3 and consist of compounds containing methane, ethane, propane, butane, and longer chain hydrocarbons, which are typically the result of some type of combustion/decomposition process. Smog is formed when ROG and NO_X react in the presence of sunlight. ROGs are a criteria pollutant since they are a precursor to O_3, which is a criteria pollutant. The terms ROG and VOC (see previous) interchangeably.	Sources similar to VOCs.	Health effects similar to VOCs.
Lead (Pb)	Pb is a heavy metal that is highly persistent in the environment and is considered a criteria pollutant. In the past, the primary source of Pb in the air was emissions from vehicles burning leaded gasoline. The major sources of Pb emissions are ore and metals processing, particularly Pb smelters, and piston-engine aircraft operating on leaded aviation gasoline. Other stationary sources include waste incinerators, utilities, and lead-acid battery manufacturers. It should be noted that the	Metal smelters, resource recovery, leaded gasoline, deterioration of Pb paint.	Fetuses, infants, and children are more sensitive than others to the adverse effects of Pb exposure. Exposure to low levels of Pb can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased Pb levels are associated with increased blood pressure.

TABLE 2-1: CRITERIA POLLUTANTS

Criteria Pollutant	Description	Sources	Health Effects
	Project does not include operational activities such as metal processing or Pb acid battery manufacturing. As such, the Project is not anticipated to generate a quantifiable amount of Pb emissions.		Pb poisoning can cause anemia, lethargy, seizures, and death; although it appears that there are no direct effects of Pb on the respiratory system. Pb can be stored in the bone from early age environmental exposure, and elevated blood Pb levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland) and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of Pb because of previous environmental Pb exposure of their mothers.
Odor	Odor means the perception experienced by a person when one or more chemical substances in the air come into contact with the human olfactory nerves (8).	Odors can come from many sources including animals, human activities, industry, natures, and vehicles.	Offensive odors can potentially affect human health in several ways. First, odorant compounds can irritate the eye, nose, and throat, which can reduce respiratory volume. Second, studies have shown that the VOCs that cause odors can stimulate sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects such as stress.

2.4 EXISTING AIR QUALITY

Existing air quality is measured at established SDAPCD air quality monitoring stations. Monitored air quality is evaluated in the context of ambient air quality standards. These standards are the

levels of air quality that are considered safe, with an adequate margin of safety, to protect the public health and welfare. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) currently in effect are shown in Table 2-2 (9), these standards are updated periodically as changes are adopted at the state or federal level.

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to the state and federal standards. At the time this AQIA was prepared, the most recent state and federal standards were reported by CARB on May 4, 2016, and are presented in Table 2-2. The air quality in a region is considered to be in attainment by the state if the measured ambient air pollutant levels for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, PM_{10}, and $PM_{2.5}$ are equal to or do not exceed the values reported in Table 2-2. All other pollutants are considered not to be in attainment if they exceed the values reported in Table 2-2. It should be noted that the three-year period presented in Table 2-4 is presented for informational purposes and is not the basis for how the State assigns attainment status. Attainment status for a pollutant means that the SDAB meets the standards set by the U.S. Environmental Protection Agency (EPA) or the California EPA (CalEPA). Conversely, nonattainment means that an area has monitored air quality that does not meet the NAAQS or CAAQS standards. To improve air quality in nonattainment areas, a State Implementation Plan (SIP) is drafted by CARB. The SIP outlines the measures that the state will take to improve air quality. Once nonattainment areas meet the standards and additional redesignation requirements, the EPA will designate the area as a maintenance area (10).

TABLE 2-2: AMBIENT AIR QUALITY STANDARDS (1 OF 2)

Ambient Air Quality Standards						
Pollutant	**Averaging Time**	**California Standards [1]**		**National Standards [2]**		
		Concentration [3]	**Method [4]**	**Primary [3,5]**	**Secondary [3,6]**	**Method [7]**
Ozone (O_3)[8]	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)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10)[9]	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 (PM2.5)[9]	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	12.0 µg/m^3	15 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)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (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)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	**No National 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[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			
See footnotes on next page …						

For more information please call ARB-PIO at (916) 322-2990 **California Air Resources Board (5/4/16)**

TABLE 2-2: AMBIENT AIR QUALITY STANDARDS (2 OF 2)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, 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 arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, 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 the U.S. EPA for further clarification and current national 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 measurement method 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 U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.
8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 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 PM10 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.
10. 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 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
11. 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-year 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 are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
12. 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.
13. 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.
14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-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.

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2.5 REGIONAL AIR QUALITY

Air pollution contributes to a wide variety of adverse health effects. The EPA has established NAAQS for six of the most common air pollutants: CO, Pb, O_3, particulate matter (PM_{10} and $PM_{2.5}$), NO_2, and SO_2 which are known as criteria pollutants. The SDAPCD monitors levels of various criteria pollutants at 12 permanent monitoring stations throughout the air district (11). On February 21, 2019, CARB posted the 2018 amendments to the state and national area designations. See Table 2-3 for attainment designations for the SDAB (12).

TABLE 2-3: ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN THE SDAB

Criteria Pollutant	State Designation	Federal Designation
O_3 – 8-hour standard	Nonattainment	Nonattainment
O_3 – 1-hour standard	Nonattainment	Attainment
PM_{10}	Nonattainment	Unclassifiable/Attainment
$PM_{2.5}$	Nonattainment	Attainment
CO	Attainment	Attainment/Maintenance
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Pb[A]	Attainment	Attainment

"-" = The national 1-hour O_3 standard was revoked effective June 15, 2005.

[A] The Federal nonattainment designation for lead is only applicable towards the Los Angeles County portion of the SDAB.

2.6 LOCAL AIR QUALITY

Air quality at a particular location is a function of the kinds, amounts, and dispersal rates of pollutants being emitted into the air locally and throughout the basin. The major factors affecting pollutant dispersion are wind speed and direction, the vertical dispersion of pollutants (which is affected by inversions), and the local topography.

Air quality is evaluated based on the number of days in which air pollution levels exceed state standards set by the State or federal standards set by the EPA. The SDAPCD maintains 12 air quality monitoring stations located throughout the greater San Diego metropolitan region. Air pollutant concentrations and meteorological information are continuously recorded at these stations. Measurements are then used to forecast daily air pollution levels.

CARB has aggregated and published monitoring data through 2019. Between 2017 and 2019 the nearest active monitoring station was the San Diego-Kearny Villa Road monitoring station, located at 6125A Kearny Villa Road in the City of San Diego, approximately 6.1 miles southeast of the Project site.

The most recent three (3) years of data available is shown on Table 2-4 and identifies the number of days ambient air quality standards were exceeded for the study area, which is considered to be representative of the local air quality at the Project sites. Data for O_3, NO_2, PM_{10}, and $PM_{2.5}$ for 2017 through 2019 was obtained from the CARB's Air Quality Data Statistics (13). Additionally,

data for CO, Pb, and SO_2 have been omitted as attainment is regularly met in the SDAB and few monitoring stations measure CO, Pb, or SO_2 concentrations.

TABLE 2-4: AIR QUALITY MONITORING SUMMARY 2017-2019

Pollutant	Standard	Year		
		2017	2018	2019
O_3				
Maximum Federal 1-Hour Concentration (ppm)		0.097	0.102	0.083
Maximum Federal 8-Hour Concentration (ppm)		0.083	0.077	0.075
Number of Days Exceeding State 1-Hour Standard	> 0.09 ppm	2	1	0
Number of Days Exceeding State/Federal 8-Hour Standard	> 0.070 ppm	6	5	1
NO_2				
Maximum Federal 1-Hour Concentration	> 0.100 ppm	0.054	0.045	0.046
Annual Federal Standard Design Value		0.009	0.008	0.008
PM_{10}				
Maximum Federal 24-Hour Concentration (µg/m^3)	> 150 µg/m^3	46	38	--
Annual Federal Arithmetic Mean (µg/m^3)		17.6	18.4	--
Number of Days Exceeding Federal 24-Hour Standard	> 150 µg/m^3	0	0	--
Number of Days Exceeding State 24-Hour Standard	> 50 µg/m^3	0	0	--
$PM_{2.5}$				
Maximum Federal 24-Hour Concentration (µg/m^3)	> 35 µg/m^3	27.5	32.2	16.2
Annual Federal Arithmetic Mean (µg/m^3)	> 12 µg/m^3	8.0	8.3	--
Number of Days Exceeding Federal 24-Hour Standard	> 35 µg/m^3	0	0	0

--= Data not available; ppm= Parts Per Million
Source: SDAPCD Historical Air Quality Data by Year.

2.7 REGULATORY BACKGROUND

2.7.1 FEDERAL REGULATIONS

The EPA is responsible for setting and enforcing the NAAQS for O_3, CO, NO_X, SO_2, PM_{10}, and Pb (14). The EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Federal Clean Air Act (FCAA) was first enacted in 1955 and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, and 1990). The CAA establishes the federal air quality standards, the NAAQS, and specifies future dates for achieving compliance (15). The FCAA also mandates that states submit and implement SIPs for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the FCAA that identify specific emission reduction goals for areas not meeting the NAAQS require a demonstration of reasonable further progress toward attainment and incorporate additional sanctions for failure to attain or to meet interim milestones. The sections of the FCAA most directly applicable to the development of the Project site include Title I (Non-Attainment Provisions) and Title II (Mobile Source Provisions) (16). Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants O_3, NO_2, SO_2, PM_{10}, CO, $PM_{2.5}$, and Pb. The NAAQS were amended in July 1997 to include an additional standard for O_3 and to adopt a NAAQS for $PM_{2.5}$. Table 2-2 provides the NAAQS within the SDAB.

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require the use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Automobile manufacturers are also required to reduce tailpipe emissions of hydrocarbons and NO_X. NO_X is a collective term that includes all forms of NO_X which are emitted as byproducts of the combustion process.

2.7.2 CALIFORNIA REGULATIONS

CARB

The CARB, which became part of the CalEPA in 1991, is responsible for ensuring implementation of the California Clean Air Act (Assembly Bill [AB] 2595) (CCAA), responding to the FCAA, and for regulating emissions from consumer products and motor vehicles. The CCAA mandates achievement of the maximum degree of emissions reductions possible from vehicular and other mobile sources to attain the state ambient air quality standards by the earliest practical date. The CARB established the CAAQS for all pollutants for which the federal government has NAAQS and, in addition, establishes standards for SO_4, visibility, hydrogen sulfide (H_2S), and vinyl chloride (C_2H_3Cl). However, at this time, H_2S and C_2H_3Cl are not measured at any monitoring stations in the SDAB because they are not considered to be a regional air quality problem. Generally, the CAAQS are more stringent than the NAAQS (17) (14).

Local air quality management districts, such as the SDAPCD, regulate air emissions from stationary sources such as commercial and industrial facilities. All air pollution control districts have been formally designated as attainment or non-attainment for each CAAQS.

Serious non-attainment areas are required to prepare Air Quality Plans (AQP) that include specified emission reduction strategies in an effort to meet clean air goals. These plans are required to include:

- Application of Best Available Retrofit Control Technology to existing sources;
- Developing control programs for area sources (e.g., architectural coatings and solvents) and indirect sources (e.g., motor vehicle use generated by residential and commercial development);
- A District permitting system designed to allow no net increase in emissions from any new or modified permitted sources of emissions;
- Implementing reasonably available transportation control measures and assuring a substantial reduction in growth rate of vehicle trips and miles traveled;
- Significant use of low emissions vehicles by fleet operators;

- Sufficient control strategies to achieve a 5% or more annual reduction in emissions or 15% or more in a period of three years for ROGs, NO_X, CO and PM_{10}. However, air basins may use alternative emission reduction strategy that achieves a reduction of less than 5% per year under certain circumstances.

TITLE 24 ENERGY EFFICIENCY STANDARDS AND CALIFORNIA GREEN BUILDING STANDARDS

California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Energy Code), was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. CCR, Title 24, Part 11: California Green Building Standards Code (CALGreen) is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect on January 1, 2011, and is administered by the California Building Standards Commission. The Energy Code and CALGreen are updated on a regular basis, with the most recent approved update that became effective January 1, 2020. The 2019 Title 24 standards will result in less energy use than previous standards, thereby reducing air pollutant emissions associated with energy consumption in the SDAB and across the State of California.

2.7.3 AIR QUALITY MANAGEMENT PLANNING

The SDAPCD is the agency that regulates air quality in the SDAB. The SDAPCD prepared the Regional Air Quality Strategy (RAQS) to address state requirements, pursuant to the CCAA of 1988 (H&SC Section 39000 et seq.). The CCAA requires areas that are designated nonattainment of CAAQS for ozone, CO, SO_2, or NO_2 to prepare and implement state plans to attain the standards by the earliest practicable date (H&SC Section 40911(a)). With the exception of state ozone standards, each of these standards has been attained in the SDAB (18).

Included in the RAQS are the Transportation Control Measures (TCMs) prepared by the San Diego Association of Governments (SANDAG) that control emissions from mobile sources (18). The RAQS and TCM set forth the steps needed to accomplish attainment of CAAQS for ozone. The most recent update of the RAQS and corresponding TCMs were adopted in 2016.

The SDAPCD has also established a set of rules and regulations initially adopted on January 1, 1969, and periodically reviewed and updated. These rules and regulations are available for review on the agency's website.

3 PROJECT AIR QUALITY IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will violate any air quality standards, contribute to an existing or projected air quality violation, or whether it will result in a cumulatively considerable net increase of a criteria pollutant for which the SDAB is non-attainment under an applicable NAAQS and CAAQS regulations. Additionally, the Project has been evaluated to determine consistency with the RAQS, potential exposure of sensitive receptors to substantial pollutant concentrations, and the impacts of odors. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The criteria used to determine the significance of potential Project-related air quality impacts are taken from the City of San Diego CEQA Significance Determination Thresholds. Based on these thresholds, a project would result in a significant impact related to air quality if it would (1):

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

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

d) Expose sensitive receptors to substantial pollutant concentrations including air toxics such as diesel particulates. "…a sensitive receptor is a person in the population who is particularly susceptible to health effects due to exposure to an air contaminant than is the population at large. Sensitive receptors (and the facilities that house them) in proximity to localized CO sources, toxic air contaminants or odors are of particular concern. Examples include:

    a. Long-Term Health Care Facilities
    b. Rehabilitation Centers
    c. Convalescent Centers
    d. Retirement Homes
    e. Residences – such as medical patients in homes
    f. Schools
    g. Playground
    h. Child Care Centers
    i. Athletic Facilities"

e) Create objectionable odors affecting a substantial number of people; or

f) Release substantial quantities of air contaminants beyond the boundaries of the premises upon which the stationary source emitting the contaminants is located.

The SDAPCD does not provide quantitative limits for determining the significance of construction or mobile source-related impacts. However, the City of San Diego CEQA Significance Determination Thresholds use the SDAPCD Air Quality Impact Analysis (AQIA) screening levels as CEQA significance thresholds for air quality. The SDAPCD AQIA screening levels (SDAPCD Rules 20.1, 20.2, and 20.3) are intended for new or modified stationary sources. Although these screening levels do not generally apply to mobile sources, for comparative purposes, these levels are used by the City of San Diego to evaluate air pollutant emissions that would be discharged to the SDAB if the Project were approved. The AQIA screening levels are shown in Table 3-1.

3.3 CALIFORNIA EMISSIONS ESTIMATOR MODEL™ (CALEEMOD) EMPLOYED TO ANALYZE AIR QUALITY

Land uses such as the Project affect air quality through construction-source and operational-source emissions.

On June 2021, the SDAPCD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the CalEEMod version 2020.40.0. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (VOCs, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$) and GHG emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved

TABLE 3-1: MAXIMUM DAILY REGIONAL EMISSIONS THRESHOLDS

Pollutant	Hourly Limits	Daily Limit	Annual Limits
CO	100 lbs/hr	550 lbs/day	100 tons/yr
NO_X	25 lbs/hr	250 lbs/day	40 tons/yr
PM_{10}	--	100 lbs/day	15 tons/yr
SO_X	25 lbs/hr	250 lbs/day	40 tons/yr
Pb	--	3.2 lbs/day	0.6 tons/yr
$PM_{2.5}$	--	67 lbs/day[1]	10 tons/yr
ROG	---	137 lbs/day	15 tons/yr

lbs./hr. = Pounds Per Hour; lbs./day = Pounds Per Day; tons/year

[1] City does not identify a $PM_{2.5}$ limit, thus the daily limit is based on SDAPCD Rule 20.2, AQIA Trigger Levels.

Source: City Significance Determination Thresholds, July 2016 and SDAPCD Rules 20.2, Table 20.2-1.

from mitigation measures (19). Accordingly, the latest version of CalEEMod has been used for this Project to determine construction and operational air quality emissions. Output from the model runs for the construction and operational activity associated with the Project are provided in Appendix 3.1 and the output for the existing land uses is provided in Appendix 3.2.

3.3.1 EMISSION FACTORS MODEL

On August 19, 2019, the EPA approved the 2017 version of the EMissions FACtor model (EMFAC) web database for use in SIP and transportation conformity analyses. EMFAC2017 is a mathematical model that was developed to calculate emission rates, fuel consumption, VMT from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by the CARB to project changes in future emissions from on-road mobile sources (20). This AQIA utilizes summer, winter, and annual EMFAC2017 emission factors to derive vehicle emissions associated with Project operational activities, which vary by season.

Because the EMFAC2017 emission rates are associated with vehicle fuel types while CalEEMod vehicle emission factors are aggregated to include all fuel types for each individual vehicle class, the EMFAC2017 emission rates for different fuel types of a vehicle class are averaged by activity or by population and activity to derive CalEEMod emission factors. The equations applied to obtain CalEEMod vehicle emission factors for each emission type are detailed in CalEEMod User's Guide *Appendix A: Calculation Details for CalEEMod* (21). EMFAC2017 emission rates utilized in this analysis can be found in Appendix 3.3 of this report.[1]

3.3.2 LAND USES MODELED IN CALEEMOD

The Project is site parcels subject to proposed development encompass approximately 26.5 acres. The Project would develop 999,386 sf of scientific research and development in five (5) buildings. This would result in a net 799,386 sf of development as the Project site currently houses 192,365 sf of research and development and a 7,370-sf covered courtyard. Only the 192,365 sf of research and development is considered for trip generation. In addition, the project site has parking, based on the City parking requirement, it is estimated 420 parking spaces are required for the existing uses. For modeling purposes, the parking was modeled as an enclosed parking structure with an elevator. CalEEMod does not provide an extensive selection of land use subtype categories; land uses that most closely fit the Project will be utilized. For purposes of this analysis, the following land uses were modeled as the Project: (22)

- 999,386 sf research and development land uses
- Surface Parking Lots with 124 spaces
- Enclosed parking structures with 2,376 parking spaces

3.4 AIR QUALITY MANAGEMENT PLANNING

The SDAPCD RAQS, outlines SDAPCD's plans and control measures designed to attain the CAAQS. The RAQS relies on land use designations and population projections[2] included in general plans and community plans for different areas within the County and its incorporated cities, as well as mobile source (vehicular) information from the SANDAG, to determine what strategies are necessary for the reduction of air pollutants to attain CAAQS.

[1] On November 20, 2019, CARB released the EMFAC Off-Model Adjustment Factors to account for the impact of the Safer Affordable Fuel-Efficient (SAFE) Vehicle Rule Part One. The emissions presented in Table 3-5 have been adjusted to reflect the adjustment factors. The adjustment factors can be found at:
https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf?utm_medium=email&utm_source=govdelivery

[2] Population growth is typically associated with the construction of residential units or large employment centers.

A project could be inconsistent with the RAQS/SIP if it results in population and/or employment growth that exceed growth estimates for the area. In the event that a project proposes development that is less dense than anticipated within the General Plan, the project would likewise be inconsistent with the RAQS. If a project proposes development that is greater than that anticipated in the City General Plan and SANDAG's growth projections upon which the RAQS is based, the project could be in conflict with the RAQS and SIP and may have a potentially significant impact on air quality. This situation would warrant further analysis to determine if the project and the surrounding projects exceed the growth projections used in the RAQS for the specific subregional area.

In 2004 SANDAG released the Regional Comprehensive Plan ("RCP") which altered the previous suburban planning paradigm in San Diego County and began moving the region toward a Smart Growth development pattern that attempted to place jobs and housing close to one another in areas connected by transit systems. A key implementation action of the RCP was the development of a Smart Growth Concept Map (SGCM) illustrating the location of existing, planned, and potential smart growth areas. First adopted in 2006 and updated in 2016, the SGMC designated the University City area as an Urban Center and notes that the minimum land use intensity target for the area is 50+ employees per acre. SANDAG is continuing these strategies in San Diego Forward: The Regional Plan (Draft 2021), which builds on the 2004 RCP and SGMC to further integrate transportation with employment and housing land uses. San Diego Forward: The Regional Plan (Draft 2021) includes the region's Sustainable Communities Strategy which is required by SB375 to include a pattern for forecasted growth and development that when combined with the transportation network, the SCS will achieve the regional GHG emission–reduction targets, accommodate the Regional Housing Needs Assessment (RHNA) Determination, and utilize the most recent planning assumptions. According to San Diego Forward: The Regional Plan (Draft 2021) at page 19, "the SCS uses areas in the region called Mobility Hubs to concentrate future development. Mobility Hubs are communities with a high concentration of people, destinations, and travel choices…". In the SCS land use pattern, forecasted growth for housing and jobs are within these areas of the region. Additionally, this SCS land use pattern identifies areas within the region that are sufficient to house the 6th Cycle RHNA Plan allocations." Figure 2-4 of San Diego Forward: The Regional Plan (Draft 2021) designates North University City as a Regional Mobility Hub and Major Employment Center. Page 32 of the San Diego Forward plan notes that "Transit and other mobility options within Mobility Hubs will support surrounding communities where future housing and jobs are envisioned. As these places grow, more people will be able to get to work, school, shopping, and other destinations without having to travel a long distance. Focusing growth in these areas will also help preserve the region's natural habitat areas and its natural resources. This growth pattern will be an important part of making the region more resilient to the impacts of climate change, including wildfire and extreme heat. As shown in Figure 2.5, the region's major employment centers and urban core mobility hubs would take on the most housing and job growth in the region over the next 30 years." Therefore, the University City area is forecast to grow significantly in jobs and housing over the next 30-years, and the Project is well within the policies directing job growth in this area.

Land use designations and population projections. While potential conflicts with the RAQS may occur when a proposed development, such as the proposed Project, seeks to add structures or density that was not accounted for on the Project site when the RAQS was prepared, the effect on anticipated regional population and employment is also important. No significant adverse impacts to population or housing are anticipated from development of the proposed Project. As noted above, the SANDAG regional growth projections forecast significant growth in jobs and housing in the University City area. The addition of scientific research and headquarters office land uses on the Project site in the University Community Plan area, which already supports extensive residential development, would provide for additional nearby employment opportunities consistent with SANDAG projections. The Project is estimated to retain 600 jobs and accommodate an additional 2,400 jobs. For the University Community Plan (UCP) area, SANDAG forecasts an additional 26,480 jobs to be added in the area from 2012 to 2050, for an increase of 30 percent (23). Therefore, the UCP area would be able to accommodate the project's addition of jobs to the area within the existing growth projections. As there are no existing residential uses on site, and housing is prohibited by the City's Prime Industrial Lands designation and the MCAS Miramar ALUCP, the Project would not displace any existing housing. Finally, the zoning-consistent use and transit-supportive nature of the Project conform to overarching goals in the UCP of developing urban nodes in the community.

Emissions from mobile sources. As noted, the RAQS is the applicable regional air quality plan that sets forth the SDAPCD's strategies for achieving the NAAQS and CAAQS. The SDAB is designated a non-attainment area for the federal and state ozone standard. Accordingly, the RAQS was developed to identify feasible emission control measures and provide expeditious progress toward attaining the standards for ozone. The two pollutants addressed in the RAQS are VOC/ROG and NO_X, which are precursors to the formation of ozone. According to the SDAPCD, the projections used to develop the RAQS emissions budgets are based on emissions from permitted sources, emissions associated with the sale of products in the region (such as architectural coatings and fuels) and regional vehicle miles traveled (VMT) estimates developed by CARB (pers. comm., Nick Cormier June 24, 2021). While all these sources are included in the RAQS, the primary driver of ozone emissions in the region is vehicle emissions.

The VMT estimates developed by CARB are based in part on SANDAG VMT estimates, which are based in part on land use plans for jurisdictions throughout the region but are also based on community activity surveys, Employment Development Department employment projections, and other regional models (18). Therefore, projects that propose development that is consistent with the land use designation in a local General Plan is unlikely to conflict with the RAQS. However, as land uses is only part of the inventory, a project that proposed a development that would generate less VMT than SANDAG predicted would also not conflict with the RAQS.

The Project site is in a Prime Industrial Lands area designated for Scientific Research in the University Community Plan. The Scientific Research designation allows for development of "scientific research and development facility[ies] … devoted to the discovery and development of new products (or the improvement of an existing product). Typical zoning is SR (23)." The Project is being developed as a scientific research campus and is therefore consistent with the land use designation.

Based on the SANDAG VMT assessment conducted for the Project, within the Project census block, the current VMT per employee is 32.1 miles (32.1 VMT/employee) (24). According to a SANDAG Project specific analysis the full development of the site would reduce the VMT per employee from 32.1 to 28.4 miles VMT/employee. The Project will implement Project specific design features and mitigation measures that are not accounted for in the SANDAG model. These additional measures would reduce the Project specific VMT per employee to 19.5 miles which is 85% of the mean employee VMT and therefore no significant impact from VMT will occur. Therefore, the Project would result in fewer VMT per employee than the initial SANDAG estimate would assume due to the implementation of Project design features and mitigation measures.

Therefore, because the Project is consistent with the land use designation for the property, is within the SANDAG growth projections for the area, and would generate less VMT than is currently assumed in SANDAG's future VMT estimates, the Project would not result in an increase in emissions that are not already accounted for in the RAQS and would not obstruct or conflict with implementation of the RAQS.

Furthermore, as detailed in Sections 3.5 and 3.6, the Project would not result in a significant air quality impact with regards to construction- and operational-related emissions of ozone precursors or criteria air pollutants. The Project would also comply with all existing and new rules and regulations as they are implemented by the SDAPCD, CARB, and/or USEPA related to emissions generated during construction.

Consistency with City of San Diego General Plan and UC Community Plan Policies. The Project would be also consistent with applicable environmental goals and objectives contained in the City's General Plan and UCCP. The General Plan's Economic Prosperity Element focuses on the long-term needs of the economy and the land uses to support them. The Economic Prosperity Element (P.EP-7) anticipates the growth in science and technology jobs and the land uses that support them stating that," Long-term changes in the economy have increasingly favored San Diego as a location for research and development functions, which can be performed in an office setting or flexible industrial space. Although current industrial development standards allow for adequate intensification of all types of industrial and office uses today, over the long term the City needs to continue to strengthen polices that support higher-intensity industrial development in particular locations that accommodate these research and development uses, supportive professional services, and corporate headquarters. Higher-intensity development also uses the City's limited land supply more efficiently." To this end, the Economic Prosperity Element designates a series of policies that call for the densification of properties, acknowledging that "[w]hile traditional industrial park development may still be required in the future, the City will follow the trend toward increasingly vertical work places, that support base sector jobs, particularly in Subregional Employment Centers such as University. These Subregional Employment Centers are supported by transit infrastructure like the trolley and Coaster commuter rail, which allow for the expansion of employment opportunities without the added vehicle trips and subsequent air emissions from those trips."

To this end, the Economic Prosperity Element provides the following policies which anticipate and encourage the densification of base sector technology jobs in Subregional Employment Centers like University:

Policy EP-A.3: Encourage large regional employers to locate and expand in the Regional Center or Subregional Employment Areas.

Policy EP-A.7: Increase the allowable intensity of employment uses in Subregional Employment Areas and Urban Village Centers where transportation and transit infrastructure exist. The role of transit and other alternative modes of transportation on development project review are further specified in the Mobility Element, Policies ME-C.8 through ME-C.10.

Policy EP-A.8: Concentrate more intense office development in Subregional Employment Areas and in Urban Villages with transit access.

Policy EP-A.9: Efficiently utilize employment lands through increased intensity in "urban villages" and Subregional Employment Areas.

Policy EP-A.10: Locate compatible employment uses on infill industrial sites and establish incentives to support job growth in existing urban areas.

Consistency with Complete Communities: Housing Solutions and Mobility Choices. The Project would implement the City's General Plan mobility and conservation policies through a combination of vehicular, bicycle, and pedestrian circulation improvements that would enhance movement within the Project and encourage alternative methods of travel, furthering City policies for sustainable methods of transportation to reduce energy use, emissions, and traffic pursuant to the City's Complete Communities: Housing Solutions and Mobility Choices program (Mobility Choices) program. Under the Mobility Choices program, the Project site is located in Mobility Zone 2 (however, the project has been conservatively analyzed and mitigated as being in Mobility Zone 3). The purpose of the Mobility Choices program is "to implement SB 743 by ensuring that new development mitigates transportation impacts based on vehicle miles traveled (VMT) to the extent feasible, while incentivizing development within the City's urban areas (Mobility Zones 1, 2, and 3)." Under the City's Mobility Choices program, Mobility Zones 1, 2, and 3 were identified as relatively VMT efficient areas. The Mobility Choices PEIR findings recognized that incentivizing development in these areas "could result in densities beyond what was assumed In the current SIP and RAQS" and that "as community plans were updated, newly designated land uses would be forwarded to the San Diego Association of Governments (SANDAG) for Inclusion in future updates to the air quality plans for the San Diego Air Basin (SDAB)." The University City Community Plan is currently undergoing a comprehensive update to plan for 2050 growth and update the 1987 to meet new General Plan policies. As the Project is consistent with the City's General Plan policies directing the intensification of employment uses in the subregional employment center of University City, and is consistent with the SANDAG land use and growth projections for Mobility Hubs and Major Employment Centers in San Diego Forward: the Regional Plan, the new job growth in University City from the Project will be accommodated in the air quality plans for the SANDAG Regional Plan and University City Community Plan Update.

RAQS CONSISTENCY CONCLUSION

Population and housing related impacts associated with the Project would not be significant. Furthermore, the Project would not result in a significant air quality impact with regards to construction- and operational-related emissions of ozone precursors or criteria air pollutants. The Project would also comply with existing and new rules and regulations as they are implemented by the SDAPCD, CARB, and/or USEPA related to emissions generated during construction. In addition, the use of the Project site as proposed and easy access to mass transit would reduce VMT for Project employees and visitors, thereby reducing pollutant emissions associated with vehicle trips, and is consistent with other regional and local policies and programs designed to reduce VMT. For the University Community Plan area, SANDAG forecasts an additional 26,480 jobs to be added in the area from 2012 to 2050, which would accommodate growth from the project. Therefore, it is unlikely that the additional structures and employment from the Project would interfere with the SDAPCD's goals for improving air quality in the SDAB. Impacts associated with conformance to regional air quality plans, including the San Diego County RAQS, would be less than significant.

3.5 CONSTRUCTION EMISSIONS

3.5.1 CONSTRUCTION ACTIVITY

Construction activities associated with the Project will result in emissions of VOCs, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$. Construction related emissions are expected from the following construction activities:

- Demolition
- Site Preparation/Grading
- Excavation
- Podium/Building Construction
- Paving
- Architectural Coating

3.5.2 CONSTRUCTION DURATION

Construction is expected to commence in April 2022 and will last through December 2027. The proposed schedule includes many overlapping phases with demolition, excavation, site preparation, building construction, paving, and painting overlapping. Based on earthwork calculations information provided by the Project contractor, and when considering the various stages of earthwork, the Project would export approximately 297,041 cubic yards (CY) of cut soil and import 7,901 of fill material. Phase 1 would export 146,600 CY and import 1,727 CY over a 20-week period. Phase 2 would export 15,406 CY and import 6,174 CY over a 5-week period. Phases 3 and 4 would export 118,876 and 16,159 CY, over 12- and 2-week periods, respectively, with no import. Site demolition would occur during Phases 1 and 4 and is anticipated to result in a total of 15,944 CY of debris.

As shown Table 3-2 most phases overlap with other phases and thus represent a combined maximum emission throughout construction. Therefore, the construction schedule utilized in

the analysis, shown in Table 3-2, represents a "worst-case" analysis scenario. Should construction occur at a time after the respective dates, emissions from construction would be lower as emission rates decrease due to emission regulations becoming more stringent over time. Based on the CalEEMod User's Guide, Section 4.3 "Offroad Equipment" as the analysis year increases, emission factors for same equipment decrease due to the fleet turnover of older equipment being replaced by newer less polluting equipment and the effects of continuing regulatory requirements. The duration of construction activity and associated equipment represents a reasonable approximation of the expected construction fleet as required per *CEQA Guidelines* (1). The duration of construction activity was based on the 2022 opening year and an end year of 2027.

3.5.3 CONSTRUCTION EQUIPMENT

Site specific construction fleet may vary due to specific Project needs at the time of construction. The associated construction equipment was generally based on CalEEMod defaults, and the Project applicant has confirmed that the equipment list is reasonable for the Project's construction. A detailed summary of construction equipment assumptions by phase is provided in Table 3-3. Please refer to specific detailed modeling inputs/outputs contained in Appendix 3.1 of this AQIA.

3.5.4 REGIONAL CONSTRUCTION EMISSIONS SUMMARY

CalEEMod calculates maximum daily emissions for summer and winter periods. The estimated maximum daily construction emissions are summarized on Table 3-4. These emissions estimates include all worker, vendor, and hauling trips, as well as on-site heavy equipment. Detailed construction model outputs are presented in Appendix 3.1. Under the modeled scenarios, emissions resulting from the Project construction will not exceed criteria pollutant thresholds established by the City for emissions of any criteria pollutant.

TABLE 3-2: CONSTRUCTION DURATION

Phase Name	Start Date	End Date	Days
Phase 1 Utilities	4/4/2022	12/19/2022	181
Phase 1 Grading	5/14/2022	10/5/2022	100
Phase 1 Building Construction	10/6/2022	12/5/2024	550
Phase 1 Paving	4/28/2023	1/16/2024	181
Demolition of Existing Building	8/31/2023	12/19/2023	76
Phase 1 Site Preparation	12/18/2023	11/4/2024	226
Phase 1 Architectural Coating	5/15/2024	11/4/2024	121
Phase 2 Grading	7/8/2024	8/16/2024	30
Phase 2 Building Construction	8/17/2024	1/12/2026	354
Phase 3 Grading	2/11/2025	5/6/2025	61
Phase 3 Building Construction	5/7/2025	7/2/2027	548
Phase 2 Architectural Coating	10/24/2025	1/12/2026	53
Phase 3 Paving	2/23/2026	12/14/2026	212
Phase 4 Grading	4/9/2026	4/22/2026	10
Phase 4 Building Construction	4/23/2026	12/30/2027	428
Phase 3 Site Preparation	9/17/2026	7/2/2027	202
Phase 4 Demolition	2/16/2027	3/22/2027	25
Building E Grading	2/16/2027	3/22/2027	25
Phase 3 Architectural Coating	3/15/2027	7/2/2027	79
Phase 4 Architectural Coating	6/26/2027	12/30/2027	129

Source: CalEEMod 2020, Appendix 3.1.

TABLE 3-3: CONSTRUCTION EQUIPMENT

Phase Name	Equipment	Amount	Hours Per Day
Phase 1 Utilities	Aerial Lifts	2	8
	Excavators	1	8
	Generator Sets	1	8
Phase 1 Grading	Crawler Tractors	2	8
	Excavators	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
Phase 1 Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	3	8
	Welders	1	8
Phase 1 Paving	Pavers	2	8
	Paving Equipment	2	8
	Rollers	2	8
Demolition of Existing Building	Concrete/Industrial Saws	1	8
	Excavators	3	8
	Rubber Tired Dozers	3	8
Phase 1 Site Preparation	Rubber Tired Dozers	4	8
	Tractors/Loaders/Backhoes	3	8
Phase 1 Architectural Coating	Air Compressors	1	8
Phase 2 Grading	Excavators	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
	Tractors/Loaders/Backhoes	2	8
Phase 2 Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	3	8
	Welders	1	8
Phase 3 Grading	Excavators	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
	Tractors/Loaders/Backhoes	2	8

TABLE 3-3: CONSTRUCTION EQUIPMENT

Phase Name	Equipment	Amount	Hours Per Day
Phase 3 Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	3	8
	Welders	1	8
Phase 2 Architectural Coating	Air Compressors	1	8
Phase 3 Paving	Pavers	2	8
	Paving Equipment	2	8
	Rollers	2	8
Phase 4 Grading	Excavators	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
	Tractors/Loaders/Backhoes	2	8
Phase 4 Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	3	8
	Welders	1	8
Phase 4 Grading	Rubber Tired Dozers	3	8
	Tractors/Loaders/Backhoes	4	8
Phase 4 Demolition	Concrete/Industrial Saws	1	8
	Excavators	3	8
	Rubber Tired Dozers	2	8
Building E Grading	Excavators	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
	Tractors/Loaders/Backhoes	2	8
Phase 3 Architectural Coating	Air Compressors	1	8
Phase 4 Architectural Coating	Air Compressors	1	8

Source: CalEEMod 2020, Appendix 3.1

TABLE 3-4: OVERALL CONSTRUCTION EMISSIONS SUMMARY

Year	Emissions (lbs/day)				
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Summer					
2022	5.80	83.50	46.41	12.44	6.60
2023	9.38	91.59	78.74	33.70	18.11
2024	28.47	94.99	74.24	38.01	20.94
2025	46.72	74.60	56.07	14.43	6.80
2026	46.69	77.36	72.36	23.09	13.04
2027	46.11	105.60	106.99	35.18	18.57
Maximum Daily Summer Emissions	46.72	105.60	106.99	38.01	20.94
Winter					
2022	5.79	84.64	46.48	12.44	6.61
2023	9.41	91.79	78.58	33.70	18.11
2024	28.49	95.56	74.12	38.01	20.94
2025	46.77	75.97	56.06	14.43	6.81
2026	46.74	78.49	72.19	23.09	13.04
2027	46.15	105.84	106.81	35.18	18.57
Maximum Daily Winter Emissions	46.77	105.84	106.81	38.01	20.94
Maximum Daily Emissions	**46.77**	**105.84**	**106.99**	**38.01**	**20.94**
City of San Diego Regional Threshold	137	250	550	100	67
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod unmitigated regional construction-source emissions are presented in Appendix 3.1.

3.6 OPERATIONAL EMISSIONS

The existing land uses are currently generators of air pollutants from various operational activities and the proposed Project would similarly result in emissions of VOCs, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$. Operational emissions come from the following primary sources:

- Area Source Emissions
- Energy Source Emissions
- Mobile Source Emissions

3.6.1 AREA SOURCE EMISSIONS

Architectural Coatings

The existing structures as well as the proposed Project are sources of emissions resulting from the evaporation of solvents contained in paints and other surface coatings as part of maintenance. The emissions associated with architectural coatings used during operation of the existing and Project were calculated using CalEEMod and emission factors were adjusted to 100 g/l to account for SDAPCD Rule 67.0.1, which limits the VOC content of architectural coatings.

Consumer Products

Consumer products include, but are not limited to detergents, cleaning compounds, polishes, personal care products, and lawn and garden products. Many of these products contain organic compounds which when released in the atmosphere can react to form O_3 and other photochemically reactive pollutants. The emissions associated with use of consumer products were calculated based on CalEEMod standard settings for both the existing and future land uses.

Landscape Maintenance Equipment

Landscape maintenance equipment would generate emissions from fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, shedders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the Project. The emissions associated with landscape maintenance equipment were calculated based on CalEEMod standard settings for both the existing and future land uses.

3.6.2 ENERGY SOURCE EMISSIONS

Electricity and natural gas are used by almost every project. For air quality evaluations, the emissions are limited to on-site natural gas sources as they are directly attributable to the Project. However, electrical generating facilities are located either outside the region (state) or offset through the use of pollution credits (RECLAIM) for generation within the SDAB. Therefore, criteria pollutant emissions from offsite generation of electricity are excluded from the evaluation of significance in air quality assessments. The emissions associated natural gas consumption were calculated based on CalEEMod emission factors that were reduced by 30% to account for Title 24 2020 for both the future land uses. Existing land uses were modeled using historical natural gas consumption factors.

3.6.3 MOBILE SOURCE EMISSIONS

Project-related air emissions derive predominantly from mobile sources. In this regard, approximately 98% (by weight) of all Project air emissions would be generated by mobile sources (vehicles). Neither the Project Applicant nor the County has any regulatory control over these tail pipe emissions. Rather, vehicle tail pipe source emissions are regulated by CARB and EPA. As summarized previously herein, as the result of CARB and EPA actions, basin-wide vehicular-source emissions have been reduced dramatically over the past years and are expected to further decline as clean vehicle and fuel technologies improve.

The Project related air emissions derive primarily from the weekday vehicle trips generated by the Project. Per information provided by Urban Systems Associates, Inc., the Project is anticipated to generate a total of 7,995 trip-ends per day (5). For purposes of evaluating the net increase in mobile source emissions, the same trip generation weas used for the existing land uses as they are also research and development. Thus, the existing land uses are estimated to generate 1,534 daily trip ends. Therefore, the net increase in trip generation is estimated at approximately 6,461 trip ends. CalEEMod's standard settings for trips lengths and purpose are used in this analysis.

3.6.5 OPERATIONAL EMISSIONS SUMMARY

Project Emissions

As previously stated, CalEEMod utilizes summer and winter EMFAC2017 emission factors to derive vehicle emissions associated with Project operational activities, which vary by season. As such, operational activities for summer and winter scenarios emissions are presented in Table 3-5. Detailed operational model outputs for the Project are presented in Appendix 3.1 and the detailed model outputs for the existing land uses are presented in Appendix 3.2.

TABLE 3-5: SUMMARY OF MAXIMUM DAILY OPERATIONAL EMISSIONS

Source	Emissions (lbs/day)				
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Summer					
Area Sources	28.36	0.00	0.38	0.00	0.00
Energy Sources	0.34	3.09	2.60	0.24	0.24
Mobile Sources	17.58	15.69	153.36	42.40	11.44
Stationary Sources	16.54	64.13	103.92	7.43	7.43
Existing Sources	-9.25	-6.07	-39.03	-8.31	-2.35
Maximum Daily Summer Emissions	53.57	76.84	221.23	41.76	16.76
Winter					
Area Sources	28.36	0.00	0.38	0.00	0.00
Energy Sources	0.34	3.09	2.60	0.24	0.24
Mobile Sources	17.01	17.00	158.73	42.40	11.45
Stationary Sources	16.54	64.13	103.92	7.43	7.43
Existing Sources	-9.15	-6.44	-40.11	-8.31	-2.35
Maximum Daily Winter Emissions	53.10	77.78	225.52	41.76	16.77
Total Maximum Daily Emissions	**53.57**	**77.78**	**225.52**	**41.76**	**16.77**
City of San Diego Regional Threshold	137	250	550	100	67
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod 2020, Appendixes 3.1 and 3.2.

As indicated, Project net operation-source emissions would not exceed the City's regional thresholds of significance for any criteria pollutants. Therefore, a less than significant impact is expected, and no mitigation measures are required.

3.7 POTENTIAL IMPACTS TO SENSITIVE RECEPTORS

The potential impact of Project-generated air pollutant emissions at sensitive receptors has also been considered. Sensitive receptors can include uses such as long-term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, childcare centers, and athletic facilities can also be considered as sensitive receptors. There nearest residential receptors are located 1,195 feet south of the site, along Leeds Street, all other residential receptors would be located at greater distances and thus exposed to lower Project

related air emissions. The nearest non-residential sensitive receptors the Scripps McDonald Center and the Pruess High School, which are located across Genesee Avenue, east of the Project site at 1,631 feet and 1,518 feet, respectively.

TOXIC AIR CONTAMINANTS

CONSTRUCTION

During short-term construction activity, the Project will also result in some diesel particulate matter (DPM) which is a listed carcinogen and toxic air contaminant (TAC) in the State of California. The 2015 Office of Environmental Health Hazard Assessment (OEHHA) revised risk assessment guidelines suggest that construction projects as short as 2-6 months may warrant evaluation. Notwithstanding, based on Urban Crossroad's professional opinion and experience in preparing health risk assessments for development projects, given the distance of the Project from surrounding sensitive receptors, the dominant wind patterns blowing to the northwest away for receptors, and the annual $PM_{2.5}$ emissions from equipment during each year of construction, any DPM generated from construction activity would result in less than significant ground level concentrations of DPM and not result in a significant health risks and no further evaluation is required.

Furthermore, many air districts throughout the state, including the SCAQMD, are currently evaluating the applicability of age sensitivity factors and have not established CEQA guidance. More specifically in their response to comments received on SCAQMD New Source Review rule, the SCAQMD explicitly states that:

"The Proposed Amended Rules are separate from the CEQA significance thresholds. The SCAQMD staff is currently evaluating how to implement the Revised OEHHA Guidelines under CEQA. The SCAQMD staff will evaluate a variety of options on how to evaluate health risks under the Revised OEHHA Guidelines under CEQA. The SCAQMD staff will conduct public workshops to gather input before bringing recommendations to the Governing Board. In the interim, staff will continue to use the previous guidelines for CEQA determinations."

OPERATIONAL

Laboratories

While the final users of the Project are not known, the Project is intended for scientific development and research, which may include laboratories. Laboratories may utilize chemicals that can result in emissions of VOCs or TACs. In general, any source which emits more than an 'insignificant' amount of VOC or TACs, must obtain and then comply with an air emission permits obtained from the SDAPCD. The SDAPCD review process would verify the laboratories implement best available control technologies including fume hoods and air scrubbers as necessary to reduce excess cancer risks to 10 in a million or less.

Diesel Generators

The proposed generators would be diesel fueled and potentially would result in exposure of sensitive receptors to DPM. Based on the CalEEMod output, the diesel generators would not generate a sufficient amount of pollutants to exceed the SDAPCD AQIA trigger level, which are

intended to identify stationary sources that would degrade air quality. As the emission of the project combined with the with the generators does not exceed these levels, it is unlikely the testing and emergency use of the generators would expose any sensitive receptor to excessive concentration of any pollutants. However, due to the hp rating of the anticipated generators (2300 – 2950 hp) the Project would require permits to construction and operate from the SDACPD. The SDAPCD review process would verify the generators have the best available control technologies to reduce excess cancer risks to 10 in a million or less.

CRITERIA POLLUTANTS

Results of the regional emissions analysis indicate that the Project will not exceed the City significance thresholds during construction. These thresholds are based on emissions level considered protective of the general public with an adequate margin of safety. Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations during Project construction. Furthermore, as discussed in Section 3.8 Project traffic would not create or result in a CO "hotspot."

Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations as the result of Project operations or associated on-stie stationary sources.

3.8 CO "HOT SPOT" ANALYSIS

As discussed below, the Project would not result in potentially adverse CO concentrations or "hot spots." Further, detailed modeling of Project-specific CO "hot spots" is not needed to reach this conclusion. An adverse CO concentration, known as a "hot spot", would occur if an exceedance of the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm were to occur. The SDAB was designated nonattainment under the CAAQS and NAAQS for CO.

It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. In response, vehicle emissions standards have become increasingly stringent in the last twenty years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the SDAB is now designated as attainment.

To establish a more accurate record of baseline CO concentrations affecting the SDAB, a CO "hot spot" analysis was conducted in 2003 for four busy intersections in Los Angeles at the peak morning and afternoon time periods. This "hot spot" analysis did not predict any violation of CO standards, as shown on Table 3-6.

TABLE 3-6: CO MODEL RESULTS

Intersection Location	CO Concentrations (ppm)		
	Morning 1-hour	Afternoon 1-hour	8-hour
Wilshire Boulevard/Veteran Avenue	4.6	3.5	4.2
Sunset Boulevard/Highland Avenue	4	4.5	3.9
La Cienega Boulevard/Century Boulevard	3.7	3.1	5.8
Long Beach Boulevard/Imperial Highway	3	3.1	9.3

Source: 2003 AQMP, Appendix V: Modeling and Attainment Demonstrations
Notes: Federal 1-hour standard is 35 ppm and the deferral 8-hour standard is 9.0 ppm.

Neither the City of San Diego, nor the SDAPCD has provided guidance within the SDAB for assessing localized impacts from CO. However, as part of its preparation of the South Coast Air Quality Management District (SCAQMD) *2003 Air Quality Management Plan (2003 AQMP)* and the *1992 Federal Attainment Plan for Carbon Monoxide* (*1992 CO Plan*), the SCAQMD determined peak CO concentrations in the SCAB were a result of unusual meteorological and topographical conditions and not a result of traffic volumes and congestion at a particular intersection (24). As evidence of this, a 9.3 ppm 8-hour CO concentration measured at the Long Beach Boulevard and Imperial Highway intersection (highest CO generating intersection within the "hot spot" analysis), only 0.7 ppm was attributable to the traffic volumes and congestion at this intersection; the remaining 8.6 ppm were due to the ambient air measurements at the time the 2003 Air Quality Management Plan (AQMP) was prepared. In contrast, the ambient 8-hour CO concentration within the Project study area is estimated at 0.7 ppm—0.9 ppm. Therefore, even if the traffic volumes for the Project were double or even triple of the traffic volumes generated at the Long Beach Boulevard and Imperial Highway intersection, coupled with the on-going improvements in ambient air quality, the Project would not be capable of resulting in a CO "hot spot" at any study area intersections.

Similar considerations are also employed by other Air Districts when evaluating potential CO concentration impacts. More specifically, the Bay Area Air Quality Management District (BAAQMD) concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour (vph)—or 24,000 vph where vertical and/or horizontal air does not mix—to generate a significant CO impact (25). Traffic volumes generating the CO concentrations for the "hot spot" analysis is shown on Table 3-7. The busiest intersection evaluated was that at Wilshire Blvd and Veteran Ave., which has a daily traffic volume of approximately 100,000 vph and AM/PM traffic volumes of 8,062 vph and 7,719 vph respectively (24). The *2003 AQMP* estimated that the 1-hour concentration for this intersection was 4.6 ppm; this indicates that, should the daily traffic volume increase four times to 400,000 vehicles per day, CO concentrations (4.6 ppm x 4= 18.4 ppm) would still not likely exceed the most stringent 1-hour CO standard (20.0 ppm)[3]. At buildout of the Project, the highest daily traffic volumes generated at the roadways within the vicinity of the Project are expected to generate less than the highest daily traffic volumes generated at the

[3] Based on the ratio of the CO standard (20.0 ppm) and the modeled value (4.6 ppm)

busiest intersection in the CO "hot spot" analysis. As such, the Project would not likely exceed the most stringent 1-hour CO standard.

The proposed Project considered herein would generate 6,461 trips and would not produce the volume of traffic required to generate a CO "hot spot" either in the context of the 2003 Los Angeles hot spot study or based on representative BAAQMD CO threshold considerations. Therefore, CO "hot spots" are not an environmental impact of concern for the proposed Project. Localized air quality impacts related to mobile-source emissions would therefore be less than significant.

TABLE 3-7: TRAFFIC VOLUMES

Intersection Location	Total (AM/PM)
Wilshire Boulevard/Veteran Avenue	8,062/7,719
Sunset Boulevard/Highland Avenue	6,614/5,374
La Cienega Boulevard/Century Boulevard	6,634/8,674
Long Beach Boulevard/Imperial Highway	4,212/5,514

Source: 2003 AQMP

3.9 ODORS

The potential for the Project to generate objectionable odors has also been considered. Land uses generally associated with odor complaints include:

- Agricultural uses (livestock and farming)
- Wastewater treatment plants
- Food processing plants
- Chemical plants
- Composting operations
- Refineries
- Landfills
- Dairies
- Fiberglass molding facilities

The Project does not contain land uses typically associated with emitting objectionable odors. Potential odor sources associated with the proposed Project may result from construction equipment exhaust and the application of asphalt and architectural coatings during construction activities and the temporary storage of typical solid waste (refuse) associated with the proposed Project's (long-term operational) uses. Standard construction requirements would minimize odor impacts from construction. The construction odor emissions would be temporary, short-term, and intermittent in nature and would cease upon completion of the respective phase of construction and is thus considered less than significant. It is expected that Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance

with the City's solid waste regulations. The proposed Project would also be required to comply with SDAPCD Rule 51 to prevent occurrences of public nuisances. Therefore, odors associated with the proposed Project construction and operations would be less than significant and no mitigation is required (26).

3.10 CUMULATIVE IMPACTS

As previously shown in Table 2-3, the CAAQS designate the Project site as nonattainment for O_3 PM_{10}, and $PM_{2.5}$ while the NAAQS designates the Project site as nonattainment for O_3. However, neither the City of San Diego, nor the SDAPCD has provided guidance on assessing impact from air quality. However, the SCAQMD has published a report on how to address cumulative impacts from air pollution: *White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution* (27). In this report the SCAQMD clearly states (Page D-3):

> *"…the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or* (Environmental Impact Report) *EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for TAC emissions. The project specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility-wide) is HI > 3.0. It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts.*
>
> *Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."*

While the South Coast air basin is different than the SDAB and has different attainment status for criteria pollutants, the method of developing the thresholds for pollutants of concern in both regions are similar and based on the respective attainment statuses. Therefore, the methodology used by the SCAQMD in assessing cumulative impacts is applicable to the SDAB and the City of San Diego Thus, this analysis assumes that individual projects that do not generate operational or construction emissions that exceed the City of San Diego recommended daily thresholds for project-specific impacts would also not cause a cumulatively considerable increase in emissions for those pollutants for which the Basin is in nonattainment, and, therefore, would not be considered to have a significant, adverse air quality impact. Alternatively, individual project-related construction and operational emissions that exceed City of San Diego thresholds for project-specific impacts would be considered cumulatively considerable.

CONSTRUCTION IMPACTS

The Project-specific evaluation of emissions presented in the preceding analysis demonstrates that Project construction-source air pollutant emissions would not result in exceedances of regional thresholds. Therefore, Project construction-source emissions would be considered less than significant on a project-specific and cumulative basis.

OPERATIONAL IMPACTS

The Project-specific evaluation of emissions presented in the preceding analysis demonstrates that Project operational-source air pollutant emissions would not result in exceedances of regional thresholds. Therefore, Project operational-source emissions would be considered less than significant on a project-specific and cumulative basis.

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4 REFERENCES

1. **Association of Environmental Professinals.** *CEQA California Environmental Quality Act Statute and Guidelines.* s.l. : Association of Environmental Professinals, 2020.
2. **City of San Diego.** *CEQA Significance Determination Thresholds.* 2017.
3. **San Diego Air Pollution Control District.** RULE 55. FUGITIVE DUST CONTROL. [Online] https://www.sdapcd.org/content/dam/sdc/apcd/PDF/Rules_and_Regulations/Prohibitions/APCD_R55.pdf.
4. —. RULE 67.0.1. Architectural Coatings. [Online] https://www.sdapcd.org/content/dam/sdc/apcd/PDF/Rules_and_Regulations/Prohibitions/APCD_R67-0-1.pdf.
5. **Urban Systems Associates, Inc.** *Towne Centre View – Local Mobility Analysis / Vehicle Miles Traveled – Scoping.* 2020.
6. **Iowa State University.** Iowa State University, Iowa Environmental Mesonet. *Station Data & Meta Data/CA_ASOSNKX MIRIMAR NAS [1947-].* [Online] 2 24, 2021. [Cited: 2 24, 2021.] https://mesonet.agron.iastate.edu/sites/site.php?station=NKX&network=CA_ASOS.
7. **South Coast Air Quality Management District.** *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning.* 2005.
8. **St. Croix Sensory, Inc.** *The "Gray Line" Between Odor Nuisance and Health Effects.* 2000.
9. **California Air Resources Board.** Ambient Air Quality Standards (AAQS). [Online] 2016. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.
10. **United State Environmental Protection Agency.** Frequent Questions about General Conformity . *EPA.* [Online] https://www.epa.gov/general-conformity/frequent-questions-about-general-conformity#8.
11. **South Coast Air Quality Management District.** Annual Air Quality Monitoring Network Plan. [Online] July 2018. http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-monitoring-network-plan/annual-air-quality-monitoring-network-plan-v2.pdf?sfvrsn=2.
12. **Air Resources Board.** State and National Ambient Air Quality Standards. [Online] https://www.arb.ca.gov/regact/2019/statereadesignations/appc.pdf?_ga=2.169398369.1537615702.1554741141-1192937971.1505156621.
13. **California Air Resources Board.** iADAM: Air Quality Data Statistics. *Top 4 Summary.* [Online] https://www.arb.ca.gov/adam/topfour/topfour1.php.
14. **Environmental Protection Agency.** National Ambient Air Quality Standards (NAAQS). [Online] 1990. https://www.epa.gov/environmental-topics/air-topics.
15. —. Air Pollution and the Clean Air Act. [Online] http://www.epa.gov/air/caa/.
16. **United States Environmental Protection Agency.** 1990 Clean Air Act Amendment Summary: Title I. [Online] https://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary-title-i.
17. **Air Resources Board.** California Ambient Air Quality Standards (CAAQS). [Online] 2009. [Cited: April 16, 2018.] http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm.
18. **San Diego Air Pollution Control DIstrict.** *Regional Air Quality Strategy.* 2016. .
19. **California Air Pollution Control Officers Association (CAPCOA).** California Emissions Estimator Model (CalEEMod). [Online] June 2021. www.caleemod.com.

20. **California Department of Transportation.** EMFAC Software. [Online] http://www.dot.ca.gov/hq/env/air/pages/emfac.htm.

21. **California Air Pollution Control Officers Association (CAPCOA).** Appendix A: Calculation Details for CalEEMod. *CalEEMod.* [Online] October 2017. http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6.

22. **California Air Pollution Control Officers Association.** California Emissions Estimator Model User's Guide. [Online] November 2017. http://www.caleemod.com/.

23. **San Diego Association of Governments.** Series 13: 2050 Regional Growth Forecast. *SANDAG.* [Online] October 15, 2013. https://www.sandag.org/index.asp?classid=12&subclassid=84&projectid=503&fuseaction=projects.detail.

24. **South Coast Air Quality Management District.** 2003 Air Quality Management Plan. [Online] 2003. https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/2003-aqmp.

25. **Bay Area Air Quality Management District.** *CEQA Guidelines and Thresholds of Significance.*

26. **South Coast Air Quality Management District.** RULE 402 NUISANCE. [Online] http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-402.pdf.

27. **Goss, Tracy A and Kroeger, Amy.** White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution. [Online] South Coast Air Quality Management District, 2003. http://www.aqmd.gov/rules/ciwg/final_white_paper.pdf.

28. **California Air Pollution Control Officers Association (CAPCOA).** California Emissions Estimator Model (CalEEMod). [Online] September 2016. www.caleemod.com.

29. **San Diego Association of Governments.** *San Diego Forward.* 2015.

30. **City of San Diego.** *University Community Plan.* 2019, as amended since December 18, 1986.

31. **The Natelson Company, Inc.** *Employment Density Study Summary Report.* s.l. : Southern California Assoication of Governments, 2001.

32. **Urban Systems Associates, Inc.** *Towne Centre View, Traffic Impact Study - Vehicle Miles Traveled.* San Diego : s.n., 2021.

33. **San Diego Assoication of Governments.** SANDAG. *Regional Models.* [Online] https://www.sandag.org/index.asp?classid=32&fuseaction=home.classhome.

5 CERTIFICATIONS

The contents of this air study report represent an accurate depiction of the environmental impacts associated with the proposed Menifee Crossroads Project. The information contained in this air quality impact assessment report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (619) 778-1971.

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ASA – Acoustical Society of America
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PROFESSIONAL CERTIFICATIONS

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Air Dispersion Modeling – Lakes Environmental • 2008

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APPENDIX 3.1:

PROJECT CALEEMOD EMISSIONS MODEL OUTPUTS

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APPENDIX 3.2:

EXISTING LAND USES CALEEMOD EMISSIONS MODEL OUTPUTS

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APPENDIX 3.3:

EMFAC 2017 OUTPUTS

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