Appendix B Supporting Documentation

RAVENSWOOD/4 CORNERS TOD SPECIFIC PLAN UPDATE AIR QUALITY & GREENHOUSE GAS ASSESSMENT

East Palo Alto, California

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Prepared for:

Amber Sharpe
Project Manager
David J. Powers & Associates, Inc.
1871 The Alameda, Suite 200
San José, CA 95126

Prepared by:

James A. Reyff
Casey Divine
Jordyn Bauer

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

I&R Project: #22-111

INTRODUCTION

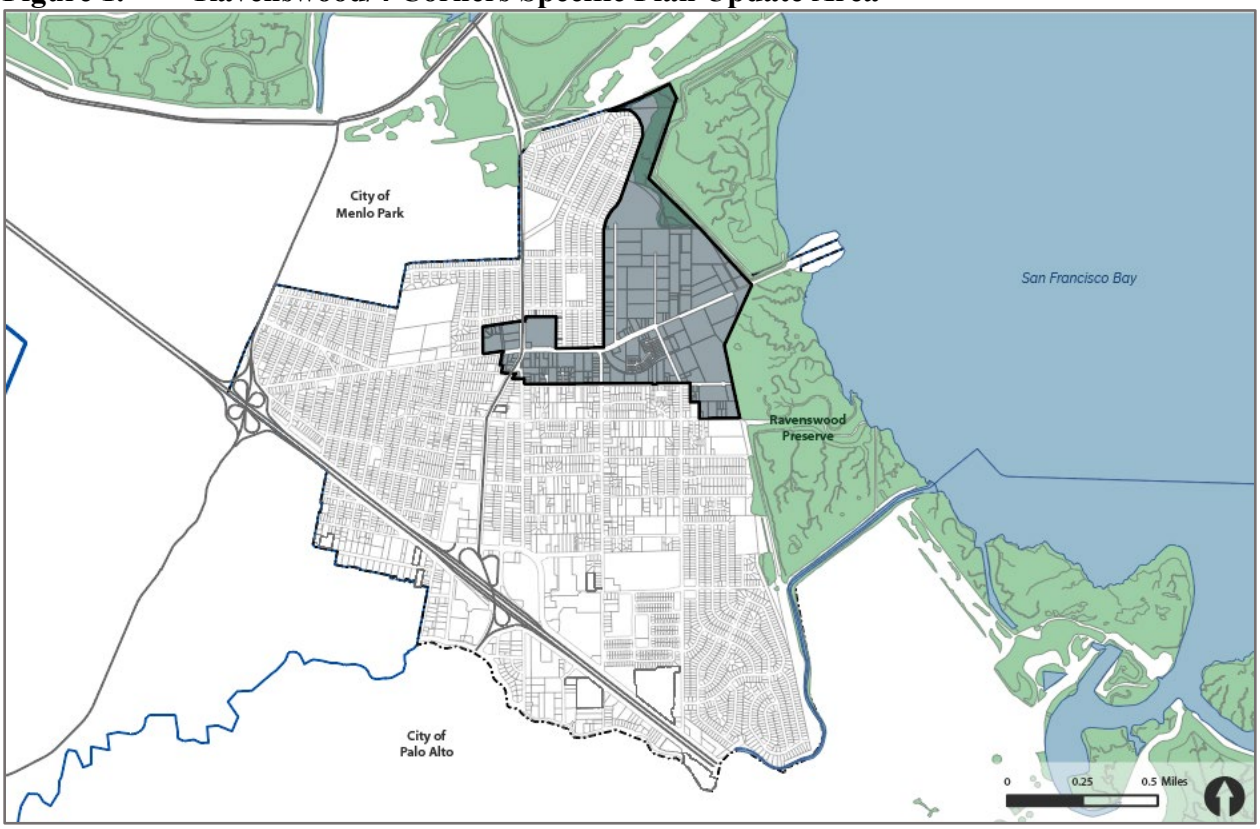
The purpose of this report is to address air quality, health risk, and greenhouse gas (GHG) impacts associated with buildout of the proposed mixed-use Ravenswood/4 Corners Transit-Oriented Development (TOD) Specific Plan Update (SPU) located in East Palo Alto, California. The air quality impacts from this Ravenswood SPU would be associated with demolition of the existing land uses, construction of the new buildings and infrastructure, and operation of the project. Air pollutants associated with construction are addressed qualitatively since construction details are not known at the level necessary to predict meaningful impacts. Impacts from the operation of the new buildings and the traffic they would generate were predicted using appropriate emissions models. In addition, the potential project health risk impacts from traffic increases were predicted. The impact of existing toxic air contaminant (TAC) sources affecting the proposed sensitive receptors that could be included in the Ravenswood SPU were also evaluated. All analyses were conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

BACKGROUND

The City of East Palo Alto adopted the existing Ravenswood Specific Plan in 2013, which allows for development of up to 1.27 million square feet (sf) of office uses, 351,820-sf of industrial or research and development (R&D) uses, 112,400-sf of retail uses, 61,000-sf of civic/community uses, and 835 housing units (comprised of 816 multi-family and 19 single-family units). The approximately 207-acre Ravenswood SPU area is located in the northeastern area of the City of East Palo Alto. The plan area is bounded by the City limits and the Union Pacific Railroad (UPRR) tracks to the north, the western edge of the UPRR easement along the back of Illinois Street to the west, Weeks Street or Runnymede Street to the south, and the Ravenswood Open Space Preserve and Palo Alto Baylands Nature Preserve to the east. A regional map and vicinity map of the Specific Plan area are shown in Figure 1. Existing development within the Specific Plan area includes residential, retail, medial office, light and heavy industrial, and institutional land uses.

[1] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*, May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

Figure 1. Ravenswood/4 Corners Specific Plan Update Area



REGULATORY FRAMEWORK

Air pollutants are governed by multiple federal and state standards to regulate and mitigate health impacts. The pollutants regulated by the US EPA include ”criteria” pollutants and 188 air toxics referred to as hazardous air pollutants (HAPs). Considering all the HAPs, the EPA has identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-hazard contributors. These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (DPM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter.

The State of California also regulates criteria pollutants, which include the federal list but also adds pollutants specific to certain industries, such as hydrogen sulfide and vinyl chloride. The State also regulates HAPs, which are referred to as TACs. The common pollutants, their potential sources, and effects are summarized in Table 1.

Table 1. Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood functions and nerve con-struction. • Behavioral and hearing problems in children.
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardiorespiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.
Toxic Air Contaminants	• Cars and trucks, especially diesel engines. • Industrial sources such as chrome platers. • Neighborhood businesses such as dry cleaners and service stations. • Building materials and product.	• Cancer. • Chronic eye, lung, or skin irritation. • Neurological and reproductive disorders.

Source: CARB, 2009. ARB Fact Sheet: Air Pollution and Health, see: https://www.arb.ca.gov/research/health/fs/fs1/fs1.htm

Federal Air Quality Regulations

At the federal level, the EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990. Pursuant to the FCAA of 1970, the EPA established National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants:

Ozone (O_3) -Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_X). The main sources of ROG and NO_X, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines) and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone is a powerful oxidant that is harmful to public health at high concentrations. Ozone, at high levels, can damage the tissues of the lungs and respiratory tract. High concentrations of ozone irritate the nose, throat, and respiratory system and constrict the airways.[2] Ozone also can aggravate other respiratory conditions such as asthma, bronchitis, and emphysema, causing increased hospital admissions. Repeated exposure to high ozone levels can make people more susceptible to respiratory infection and lung inflammation and permanently damage lung tissue. Ozone can also have negative cardiovascular impacts, including chronic hardening of the arteries and acute triggering of heart attacks.

Carbon Monoxide - Carbon monoxide (CO) is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. While CO transport is limited, it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, hospital patients, etc.). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal.

Nitrogen Dioxide - Nitrogen Dioxide (NO_2) is a reddish-brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide - Sulfur dioxide (SO_2) is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

[2] See: California Air Resource Board, Web: https://ww2.arb.ca.gov/resources/ozone-and-health

Particulate Matter - Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are larger than 2.5 microns but smaller than 10 microns (PM_{10}). $PM_{2.5}$ refers to fine suspended particulate matter with an aerodynamic diameter of 2.5 microns or less that is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM_{10} and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as by-products of fuel combustion, through abrasion, such as tire or brake lining wear, or through fugitive dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions. Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces and can enter the human body through the lungs.

Lead - Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline in the 1990's, metal processing is currently the primary source of lead emissions. The highest levels of lead emissions are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufactures.

NAAQS include both primary and secondary standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.[3] Areas (i.e., air basins) that do not meet the NAAQS, or nonattainment areas, are required to develop State Implementation Plans (SIPs) that are designed to bring them into attainment of the NAAQS by specific dates.

The FCAA Amendments of 1990 changed deadlines for attaining NAAQS as well as the remedial actions required of areas of the nation that exceed the standards. Conformity with an area's SIP requirements satisfy the FCAA requirements for a given project.

State Air Quality Regulations

California Clean Air Act

In 1988, the CCAA established its own, more stringent ambient air quality standards, known as California Ambient Air Quality Standards (CAAQS). The CCAA requires that all air basins in the state endeavor to achieve and maintain CAAQS for CO, O_3, SO_2, and NO_2 by the earliest practical date. The CCAA establishes local air districts and provides them with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment area in the State is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, for each nonattainment pollutant or its precursors. A Clean Air Plan is a SIP that shows how a district would reduce emissions to achieve air quality standards.

[3] See: U.S. Environmental Protection Agency, Web: https://www.epa.gov/criteria-air-pollutants/naaqs-table, Accessed 13 August 2020

California Air Resources Board

The California Air Resources Board (CARB) is the agency responsible for coordination with the EPA and developing SIPs to achieve and maintain both the NAAQS and CAAQS. As a result, it has oversight of the state's air pollution control programs. Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, and off-road vehicles.

California Air Resources Board Handbook

In 1998, CARB identified particulate matter from diesel-fueled engines (i.e., DPM) as a toxic air contaminant. CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[4] CARB subsequently developed an Air Quality and Land Use Handbook[5] (Handbook) in 2005 that is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. The 2005 CARB Handbook recommends that planning agencies consider proximity to air pollution sources when considering new locations for "sensitive" land uses, such as residences, medical facilities, daycare centers, schools, and playgrounds.

Air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the Handbook relative to the Plan Area include taking steps to consider or avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day or rural roads with 50,000 vehicles/day.
- Within 300 feet of gasoline fueling stations (note that new fueling stations utilize enhanced vapor recovery systems that substantially reduce emissions).
- Within 300 feet of dry-cleaning operations (note that dry cleaning with TACs is being phased out and will be prohibited in 2023).

Advanced Clean Cars

The Advanced Clean Cars Program, adopted by CARB in 2012, was designed to bring together CARB's traditional passenger vehicle requirements to meet federal air quality standards and also support California's AB 32 goals to develop and implement programs to reduce GHG emissions

[4] California Air Resources Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October.
[5] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

back down to 1990 levels by 2020, a goal achieved in 2016 as a result of numerous emissions reduction programs.

This recent rule, *Advanced Clean Cars II (ACC II)* is phase two of the original rule. ACC II establishes a year-by-year process, starting in 2026, to have all new cars and light trucks sold in California be zero emission vehicles (ZEVs) by 2035. The regulation codifies the light-duty vehicle goals set out in Governor Newsom's Executive Order N-79-20. Currently, 16 percent of new light-duty vehicles sold in California are zero emissions or plug-in hybrids. By 2030, 68 percent of new vehicles sold in California would be zero emissions and 100 percent by 2035.

On-road Heavy-Duty Diesel Vehicle Regulations

CARB is actively enforcing on-road heavy-duty diesel vehicle regulations that require fleets to replace or retrofit older heavy-duty diesel vehicles. As of January 1, 2020, the DMV cannot register any vehicle that does not meet the diesel engine replace/retrofit requirements. Other CARB diesel programs affecting heavy-duty diesel vehicles include:

- Idling limits of no more than 5 minutes with special exceptions.
- Emission Control Labels must be affixed to engines of all commercial heavy-duty diesel vehicles, and must be legible as proof the engine, at minimum, meets U.S. federal emissions standards for the engine model year.
- The Periodic Smoke Inspection Program requires owners of California-based fleets of two or more diesel vehicles to perform annual smoke opacity tests and to keep records for at least two years for each vehicle.
- The Heavy-Duty Vehicle Inspection Program uses random roadside inspections to verify that diesel engines do not smoke excessively and are tamper-free.

Advanced Clean Trucks (ACT)

California's Advanced Clean Trucks (ACT) rule increases the percentage of medium and heavy-duty trucks sold as ZEVs beginning in 2024. By 2035, 40 to 75 percent of new trucks sold, depending on size, would have to meet ZEV requirements. In addition, large employers including retailers, manufacturers, brokers, and others are required to report about their existing fleet operations and report information about shipments and shuttle services with 50 or more trucks,.

Off-Road Vehicle and Equipment Regulations

CARB has adopted and implemented regulations to reduce DPM and nitrogen oxides (NOx) emissions from in-use (existing) and new off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower (hp) or greater. The regulations are intended to reduce particulate matter and NOx exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve

specified fleet-averaged emission rates. Implementation of this regulation, in conjunction with stringent Federal off-road equipment engine emission limits for new vehicles, is expected to substantially reduce emissions of DPM and NOx.

Fleet owners must report the vehicle and engine information for all vehicles within their fleets operating in California. Fleet owners must also report owner information using DOORS, which is CARB's online reporting tool. CARB issues a unique Equipment Identification Number (EIN) that is assigned to each vehicle. The fleet owner must label their vehicles with the EIN.

Other CARB diesel programs affecting off-road vehicles and equipment include:

- Idling limits of no more than 5 minutes with special exceptions.
- Portable engines 50 hp or greater may require a permit or registration to legally operate.

Bay Area Air Quality Management District

The BAAQMD is the local air quality management authority charged with attainment of the NAAQS/CAAQS and maintenance of air quality in the San Francisco Bay Area Air Basin (SFBAAB). They do this through a comprehensive program of planning, regulation, enforcement, technical innovation, and education. The BAAQMD also inspects stationary sources and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by law.

<u>BAAQMD Rules and Regulations</u>

Emissions from appliances and equipment installed within the planning area are subject to BAAQMD permitting rules and regulations. The BAAQMD Rules and Regulations that apply to the planning area include:

- Regulation 2 – Permits
  - Rule 2-1: General Requirements
  - Rule 2-2: New Source Review
  - Rule 2-5: New Source Review of Toxic Air Contaminants
- Regulation 6 – Particulate Matter and Visible Emissions
  - Rule 6-2: Commercial Cooking Equipment
  - Rule 6-3: Wood-Burning Devices
  - Rule 6-7: Odorous Substances
- Regulation 7 – Odorous Substances
- Regulation 9 – Inorganic Gaseous Pollutants
  - Rule 9-1: Sulfur Dioxide
  - Rule 9-7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, And Process Heaters
  - Rule 9-8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines

Permits

Rule 2-1-301 requires that any person installing, modifying, or replacing any equipment, the use of which may reduce or control the emission of air contaminants, shall first obtain an Authority to Construct (ATC).

Rule 2-1-302 requires that written authorization from the BAAQMD in the form of a Permit to Operate (PTO) be secured before any such equipment is used or operated.

Rule 2-1 lists sources that are exempt from permitting.

New Source Review

Rule 2-2, New Source Review (NSR), applies to all new and modified sources or facilities that are subject to the requirements of Rule 2-1-301. The purpose of the rule is to provide for review of such sources and to provide mechanisms by which no net increase in emissions will result.

Rule 2-2-301 requires that an applicant for an ATC or PTO apply Best Available Control Technology (BACT) to any new or modified source that results in an increase in emissions and has emissions of precursor organic compounds, non-precursor organic compounds, NOx, SO_2, PM_{10}, or CO of 10.0 pounds or more per highest day. Based on the estimated emissions from the proposed project, BACT will be required for NOx emissions from the diesel-fueled generator engines.

Rule 2-5 applies to new and modified sources of TAC emissions. BAAQMD evaluates the TAC emissions in order to evaluate potential public exposure and health risk, to mitigate potentially significant health risks resulting from these exposures, and to provide net health risk benefits by improving the level of control when existing sources are modified or replaced. Toxics BACT (or TBACT) is applied to any new or modified source of TACs where the source risk is a cancer risk greater than 1.0 in one million and/or a chronic hazard index greater than 0.20. Permits are not issued for any new or modified source that has risks or net project risks that exceed a cancer risk of 10.0 in one million or a chronic or acute hazard index of 1.0.

Stationary Diesel Airborne Toxic Control Measure

The BAAQMD administers the CARB's Airborne Toxic Control Measure (ACTM) for Stationary Diesel engines (section 93115, title 17 CA Code of Regulations). The project's stationary sources will be new stationary emergency stationary emergency standby diesel engines larger than 50 hp. These limits vary based on maximum engine power. All engines are limited to PM emission rates of 0.15 g/hp-hour, regardless of size. This ACTM limits engine operation 50 hours per year for routine testing and maintenance.

Offsets

Rule 2-2-302 requires that offsets be provided for a new or modified source that emits more than 10 tons per year of NOx or precursor organic compounds.

Prohibitory Rules

Regulation 6 pertains to particulate matter and visible emissions. Although the engines will be fueled with diesel, they will be modern, low emission engines. Thus, the engines are expected to comply with Regulation 6.

Rule 6-2 applies to emissions from commercial kitchens. Effective January 1, 2009, no person shall operate a charbroiler unless it is equipped and operated with a certified catalytic oxidizer or exhausted through a certified controlled device.

Rule 6-3 applies to emissions from wood-burning devices. Effective November 1, 2016, no person or builder shall install a wood-burning device in a new building construction.

Regulation 7 places general limitations on odorous substances and specific emission limitations on certain odorous compounds when the District receives odor complaints. The regulation prohibits discharge of odorous substance that causes the ambient air at or beyond the property line to be odorous and to remain odorous after dilution with four parts of odor-free air and places limits on certain odorous compounds or family of compounds.

Rule 9-1 applies to sulfur dioxide. The engines will use ultra-low sulfur diesel fuel (less than 15 ppm sulfur) and will not be a significant source of sulfur dioxide emissions and are expected to comply with the requirements of Rule 9-1.

Rule 9-7 limits the emissions of NOx CO from industrial, institutional and commercial boilers, steam generators and process heaters. This regulation typically applies to boilers with a heat rating of 2 million British Thermal Units (BTU) per hour

Rule 9-8 prescribes NOx and CO emission limits for stationary internal combustion engines. Since the proposed engines will be used with emergency standby generators, Regulation 9-8-110 exempts the engines from the requirements of this Rule, except for the recordkeeping requirements (9-8-530) and limitations on hours of operation for reliability-related operation (maintenance and testing). The engines will not operate more than 50 hours per year, which will satisfy the requirements of 9-8-111.

BACT for Diesel Generator Engines

Since the generators will be used exclusively for emergency use during involuntary loss of power, the BACT levels listed for IC compression engines in the BAAQMD BACT Guidelines would apply. These are provided for two separate size ranges of diesel engines:

- I.C. Engine – Compression Ignition >50hp and <1,000hp: BAAQMD applies BACT 2 emission limits based on the ATCM for stationary emergency standby diesel engines larger than 50 brake-horsepower (BHP). NOx emission factor limit is subject to the CARB ACTM that ranges from 3.0 to 3.5 grams per horsepower hour (g/hp-hr). The PM (PM_{10} or $PM_{2.5}$) limit is 0.15 g/hp-hr per CARB's ACTM.

- I.C. Engine – Compression Ignition >999hp: BAAQMD applies specific BACT emission limits for stationary emergency standby diesel engines equal or larger than 1,000 brake-horsepower (BHP). NOx emission factor limit is 0.5 g/hp-hr. The PM (PM_{10} or $PM_{2.5}$) limit is 0.02 g/hp-hr. POC (i.e., ROG) limits are 0.14 g/hp-hr.

Clean Air Plan

The BAAQMD is responsible for developing a Clean Air Plan which guides the region's air quality planning efforts to attain the NAAQS and CAAQS. The BAAQMD's *2017 Clean Air Plan* is the latest air quality plan which contains district-wide control measures to reduce ozone precursor emissions (i.e., ROG and NO_X), particulate matter, and greenhouse gas (GHG) emissions. The *2017 Clean Air Plan*, which was adopted on April 19, 2017 by the BAAQMD's board of directors:

- Updates the Bay Area 2010 Clean Air Plan in accordance with the requirements of the CCAA to implement "all feasible measures" to reduce ozone;
- Provides a control strategy to reduce ozone, particulate matter, air toxics, and GHGs in a single, integrated plan;
- Reviews progress in improving air quality in recent years; and
- Continues and updates emission control measures.

Planning Healthy Places

BAAQMD developed a guidebook that provides air quality and public health information intended to assist local governments in addressing potential air quality issues related to exposure of sensitive receptors to exposure of emissions from local sources of air pollutants. The guidance provides tools and recommends best practices that can be implemented to reduce exposures. The information is provided as recommendations to develop policies and measures in city or county General Plans, neighborhood or specific plans, land use development ordinances, or into projects.

BAAQMD California Environmental Quality Act Air Quality Guidelines

The BAAQMD California Environmental Quality Act (CEQA) Air Quality Guidelines[6] were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for TACs, odors, and GHG emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of their CEQA Guidelines. In May 2011, the updated BAAQMD CEQA Air Quality Guidelines were amended to include a health risk and hazards threshold for new receptors and modify procedures for assessing

[6] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

impacts related to TAC impacts. The Guidelines were updated again in May 2017 and this version serves as the air district's most recent CEQA guidance.

Per Appendix G of the CEQA Guidelines, air quality and GHG impacts are considered significant if implementation of the General Plan (or specific area plan) would:

1) Conflict with or obstruct implementation of an applicable air quality plan.
2) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard.
3) Expose sensitive receptors to substantial pollutant concentrations.
4) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.
5) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
6) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Additionally, specific projects within a planning area that have TAC emissions that could adversely affect sensitive receptors must prepare a health risk assessment to quantify the potential risks to the community and, if appropriate, identify mitigation measures to reduce impacts.

The BAAQMD's current significance thresholds are listed in Table 2 and Table 3. Though not necessarily a CEQA issue, the effect of existing TAC sources on future sensitive receptors (e.g., residences) is requested by BAAQMD to comply with the 2017 Clean Air Plan's key goal of reducing population TAC exposure and protecting public health in the Bay Area.

Table 2. BAAQMD Plan-Level Air Quality Significance Thresholds

Pollutant/Contaminant	Construction	Operational
Criteria Air Pollutants and Precursors	None	1. Consistency with Current Air Quality Plan control measures 2. Projected VMT or vehicle trip increase is less than or equal to projected population increase
Risks and Hazards	None	1. Overlay zones around existing and planned sources of TACs (including adopted Risk Reduction Plan areas) 2. Overlay zones of at least 500 feet from all freeways and high-volume roadways For this analysis – overlay zones are based on potential for sources to result in the following impacts: 1. Excess cancer risk >10.0 chances per million 2. Annual PM2.5 Concentration > 0.3 $\mu g/m^3$ 3. Hazard Index >1.0
Odors	None	Identify the location, and include policies to reduce the impacts, of existing or planned sources of odors

Table 3. BAAQMD Project-Level Air Quality Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	**Average Daily Emissions (lbs./day)**	**Annual Average Emissions (tons/year)**
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all Sources within 1,000-foot zone of influence)**	
Excess Cancer Risk	10 per one million	100 per one million	
Hazard Index	1.0	10.0	
Incremental annual $PM_{2.5}$	0.3 µg/m^3	0.8 µg/m^3	
Odors	**Complaints**		
Detection	5 confirmed complaints per year averaged over three years		
Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less.			

Source: Bay Area Air Quality Management District, 2017

CARE Program

The BAAQMD's Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area.[7] The program examines TAC emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program has been implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses has been used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area. The BAAQMD has identified six communities as impacted: Concord, Richmond/San Pablo, Western Alameda County, San José, Redwood City/East Palo Alto, and Eastern San Francisco.

[7] See BAAQMD: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program.

Overburdened Communities Program

To address localized health impacts in Bay Area communities, BAAQMD staff met with community advocacy organizations to develop concepts and recommendations on how the air district could be more health protective. Through a series of public workshops and a public comment period, BAAQMD amended Rule 2 (i.e., Regulation 2-1-24) in 2021. It identifies an *overburdened* community as an area located (i) within a census tract identified by the California Office of Environmental Health Hazard Assessment's (OEHHA's) Communities Environmental Health Screening Tool (CalEnviroScreen), Version 4.0, as having an overall score at or above the 70th percentile, or (ii) within 1,000 feet of any such census tract. Projects in overburdened communities must conduct specific public involvement activities and stationary sources are subject to specific permitting requirements.

City of East Palo Alto

Vista 2035 East Palo Alto General Plan

On October 4, 2016, the City of East Palo Alto adopted the *Vista 2035 East Palo Alto General Plan*, which was an update to the City's 1999 General Plan and Zoning Ordinance.[8] The final version was published March 2017. The General Plan is the foundation for establishing goals, purposes, zoning, and activities allowed on each land parcel to provide compatibility and continuity to the entire region as well as each individual neighborhood. This general plan includes goals and policies to improve air quality within East Palo Alto. The goals, policies, and programs relevant to air quality are contained in the *Land Use and Urban Design, Transportation, Health and Equity,* and *Parks, Open Space, and Conservation* Chapters.

Land Use and Urban Design.

Goal LU-1. Maintain an urban form and land use pattern that enhances the quality of life and meets the community's vision for its future.

Intent: To provide housing, employment, retail and services, recreation, arts, education and entertainment for the City's residents and businesses in an urban environment that promotes health, equity, prosperity, and well-being.

Policies:

1.1 Balanced land uses. Create a balanced land use pattern to support a jobs-housing balance, minimize traffic and vehicle miles traveled, reduce greenhouse gas emissions, and promote a broad range of housing choices, retail businesses, employment opportunities, cultural venues, educational institutions and other supportive land uses.

[8] City of East Palo Alto, 2017. *Vista 2035 East Palo Alto General Plan*. March. Web: http://www.ci.east-palo-alto.ca.us/DocumentCenter/View/3187

Goal LU-9. Provide an urban environment that is tailored to the pedestrian.

Intent: To support and increase pedestrian activity and walkability throughout the City, encouraging a vibrant public realm and walking as a safe, comfortable, healthy and viable mode of transportation.

Policies:

9.3 Landscaping. Require development projects to incorporate drought tolerant, native species landscaping in order to extend and enhance the green space network of the City.

Goal LU-17. Preserve the single-family character of the University Village area.

Intent: To enhance the character and identity of University Village as development occurs in the Ravenswood area.

Policies:

17.10 Transit Stop. Continue to work with regional agencies to monitor the use of Dumbarton rail corridor for commuter rail service and seek to protect the University Village from noise, air quality, and other impacts.

Transportation

Goal T-8. Adopt transportation demand management and roadway system efficiency strategies.

Intent: To increase transportation choices, improve public health, reduce pollution, make effective use of roadway capacity and decrease automobile traffic by improving management of existing roadways and implementing complementary policies promoting transit, walking, bicycling and complete streets.

Policies:

8.1 Transportation Demand Management (TDM). Promote effective TDM programs to reduce travel demand from existing and new development, shifting trips to alternative modes. Regularly update the TDM ordinance to establish effective requirements that reduce travel demand from existing and new development. Require projects to implement TDM programs, as defined in the TDM ordinance.

Health and Equity

Goal HE-4. Safely and Systemically address toxics, legacy pollutants, and hazardous materials.

Intent: To protect residents and visitors against harmful health and other impacts associated with dangerous materials that may pose a threat to life and property, and may dictate costly public improvements. Reduction or elimination of these hazards can be accomplished with concerted efforts.

Policies:

4.1 Toxic Waste. Prohibit new non-residential uses that are known to release or emit toxic waste at levels that are harmful to human health while continuing to allow R&D uses, and other necessary services such as dry cleaners.

4.2 Pollutants. Continue to work with state, federal, regional, and local agencies to eliminate and reduce concentrations of regulated legacy pollutants.

Goal HE-10. Improve respiratory health through the City and strive to reduce incidence of asthma and other respiratory illnesses.

Intent: To use policies and regulations that reduce the impact of air pollution on residents in East Palo Alto.

Policies:

10.1 Highway buffers. Discourage the development of sensitive land uses (schools, health care clinics, and elder and childcare facilities) within 500 feet of freeways and stationary sources of air pollution.

10.2 Air pollution mitigation. Require that new multi-family development located within 500 feet of freeways or along University Avenue implement appropriate mitigation measures such as air filtration/ventilation systems, landscaping and other physical improvements as recommended by the California Air Resources Board (CARB) and/or the Bay Area Air Quality Management District to reduce indoor air pollution.

10.3 Landscape barriers. Plant landscape buffers between Highway 101 and residential areas to reduce noise and air pollution for residential areas.

10.4 No new truck routes. Prohibit the designation of new truck routes on residential and collector streets in East Palo Alto.

10.6 Electric vehicle fleet. Improve air quality and respiratory health through City programs and operations such as converting to a clean-air and primarily electric fleet.

10.7 Other mobility strategies. Implement the strategies in the Transportation Element that improve air quality. These include transit, walking, biking and Transportation Demand Management strategies.

Goal HE-13. All housing is designed and built in a way that facilitates health, sustainability, and efficiency.

Intent: To ensure that all housing has healthy indoor air that is free from pollutants such as tobacco smoke, mold, carbon monoxide, and radon, and is constructed from materials that do not contain hazardous elements, such as lead or asbestos.

Policies:

13.1 Healthy design guidelines. Support creativity in the construction of new housing by proactively developing zoning and healthy design guidelines. Solicit broad public input during the drafting.

13.2 Healthy housing codes. Review, revise, and update the building code (as well as other relevant plans, procedures, regulations, guidelines, programs, and design manuals) as needed, in order to promote healthy housing quality.

13.3 Healthy design checklists. Work with developers to prioritize health in planned construction, using healthy designed checklists and/or review tools (such as the Building Design Checklist by the Center for Active Design).

Parks, Open Space, and Conservation

Goal POC-6. Preserve and expand the urban forest on both public and private property.

Intent: To maximize the benefits of a healthy urban forest, especially to counteract the impacts of highways and other sources of air pollution.

Policies:

6.2 New tree planting. Prioritize the planting of new trees on sites designated as sensitive receptors (e.g., schools, health centers) or that are in close proximity to sources of air pollution such as freeways and heavily traveled road corridors.

6.4 Urban forestry programs. Support education and outreach programs to inform community members about the benefits of urban trees, including shade, improved air quality, filtration of stormwater, and wildlife habitat. Educate the community about proper tree maintenance.

Safety and Noise

Goal SN-8. Coordinate land use planning to prevent new odor complaints.

Intent: To avoid conflicts related to bad odors, especially between incompatible use.

Policies:

8.1 Identify potential for odor complaints. Use BAAQMD Odor Screening Distances or City-specific screening distances to identify odor potential. Evaluate odors from sources within these screening distances based on odor potential, wind conditions, setback distance and receptor type.

8.2 Odor sources. Prohibit new sources of odors that have the potential to result in frequent odor complaints unless it can be shown that potential odor complaints can be mitigated.

8.3 Sensitive receptors near odor sources. Prohibit sensitive receptors from locating near odor sources where frequent odor complaints would occur, unless it can be shown that potential odor complaints can be mitigated.

City of East Palo Alto General Plan Update FEIR

The City of East Palo Alto adopted the City of East Palo Alto General Plan Update Final Environmental Impact Report (FEIR) in August 2016. The FEIR addressed air quality impacts associated with implementation of *Vista 2035 East Palo Alto General Plan*. Mitigation measures applicable to individual projects were included in the FEIR to reduce impacts from construction and operation, as BAAQMD emissions and health risk thresholds still apply to individual projects. Mitigation measures required by the *Vista 2035 East Palo Alto General Plan* include:

MM AQ-1: Implement BAAQMD-Recommended Measures to Control Particulate Matter Emissions during Construction. Measures to reduce DPM and PM_{10} from construction are recommended to ensure that short-term health impacts to nearby sensitive receptors are avoided. These measures are listed below:

- Water all active construction areas at least twice daily and more often during windy periods. Active areas adjacent to residences should be kept damp at all times.
- Cover all hauling trucks or maintain at least two feet of freeboard.
- Pave, apply water at least twice daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas and sweep streets daily (with water sweepers) if visible soil material is deposited onto the adjacent roads.

- Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (i.e., previously graded areas that are inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles.
- Limit traffic speeds on any unpaved roads to 15 mph.
- Replant vegetation in disturbed areas as quickly as possible.
- Suspend construction activities that cause visible dust plumes to extend beyond the construction site.
- Post a publicly visible sign(s) with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
- Measures to reduce exhaust emissions from large construction projects:
- The developer or contractor shall provide a plan for approval by the City or BAAQMD demonstrating that the heavy-duty (>50 horsepower) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a project wide fleet-average 20 percent NOx reduction and 45 percent particulate reduction compared to the most recent CARB fleet average for the year 2011.
- Clear signage at all construction sites will be posted indicating that diesel equipment standing idle for more than five minutes shall be turned off. This would include trucks waiting to deliver or receive soil, aggregate or other bulk materials. Rotating drum concrete trucks could keep their engines running continuously as long as they were onsite or adjacent to the construction site.
- The contractor shall install temporary electrical service whenever possible to avoid the need for independently powered equipment (e.g., compressors).
- Properly tune and maintain equipment for low emissions.

MM AQ-2: Require Project-Level Construction Health Risk Assessment. Construction health risk assessments will be required on a project-by-project basis, either through screening or refined modeling, to identify impacts and, if necessary, include measures to reduce exposure. Reduction in health risk can be accomplished through, though is not limited to, the following measures:

- Construction equipment selection;
- Use of alternative fuels, engine retrofits, and added exhaust devices;
- Modify construction schedule; and
- Implementation of BAAQMD Basic and/or Additional Construction Mitigation Measures for control of fugitive dust.

MM AQ-3: Require Project-Level Health Risk Assessment For New Development. Future development under the General Plan Update that includes sensitive receptors (such as schools, hospitals, daycare centers, or retirement homes) located within the setback

distances from highways, railroads, local roadways, and stationary sources shall require site-specific analysis to determine the level of TAC and $PM_{2.5}$ exposure. This setback distance ranges from <50 feet to 1,000 feet, depending on the TAC source. This analysis shall be conducted following procedures outlined by BAAQMD. If the site-specific analysis reveals significant exposures, such as cancer risk greater than 10 in one million or cumulative cancer risk greater than 100 in one million, additional measures shall be employed to reduce the risk to below the threshold. If this is not possible, the sensitive receptors shall be relocated.

Future non-residential developments would be evaluated through the CEQA process or BAAQMD permit process to ensure that they do not cause a significant health risk in terms of excess cancer risk greater than 10 in one million, acute or chronic hazards with a Hazard Index greater than 1.0, or annual $PM_{2.5}$ exposures greater than 0.3 $\mu g/m^3$, or a significant cumulative health risk in terms of excess cancer risk greater than 100 in one million, acute or chronic hazards with a Hazard Index greater than 10.0, or annual $PM_{2.5}$ exposures greater than 0.8 $\mu g/m^3$.

For significant cancer risk exposure, as defined by BAAQMD, indoor air filtration systems shall be installed to effectively reduce particulate levels to a less-than-significant level. Project sponsors shall submit performance specifications and design details to demonstrate that lifetime residential exposures would result in less-than-significant cancer risks (less than 10 in one million chances or 100 in one million for cumulative sources).

Ravenswood Ravenswood/4 Corners TOD Specific Plan

In 2013, the City of East Palo Alto adopted the *Ravenswood/4 Corners TOD Specific Plan* to outline how the area would be transformed into thriving districts that provide places to live, employment opportunities, parks, open spaces, and amenities for all of East Palo Alto. The Specific Plan creates a framework for transforming the intersection of University Avenue and Bay Road into a new "downtown" for East Palo Alto. In addition, it provides detailed regulations for all new development that occurs in Ravenswood and 4 Corners area.

The Final Environmental Impact Report (FEIR) for the Plan was completed in 2012 and addresses air quality impacts associated with implementation of the plan. Mitigation measures applicable to individual projects were identified to reduce impacts from the construction and operation of projects in the area. They include:

- Mitigation Measure AQ-2: Implementation of BAAQMD Basic and/or Additional Construction Mitigation Measures for control of fugitive dust.

- Mitigation Measure AQ-3: New restaurants located in mixed-use developments, or adjacent to residential developments, shall install kitchen exhaust vents with filtration systems, re-route vents away from residential development, or use other accepted methods of odor control, in accordance with local building and fire codes.

SETTING AND EXISTING AIR QUALITY CONDITIONS

The project is located in San Mateo County, which is part of the San Francisco Bay Area Air Basin. The Air Basin includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest portion of Solano County.

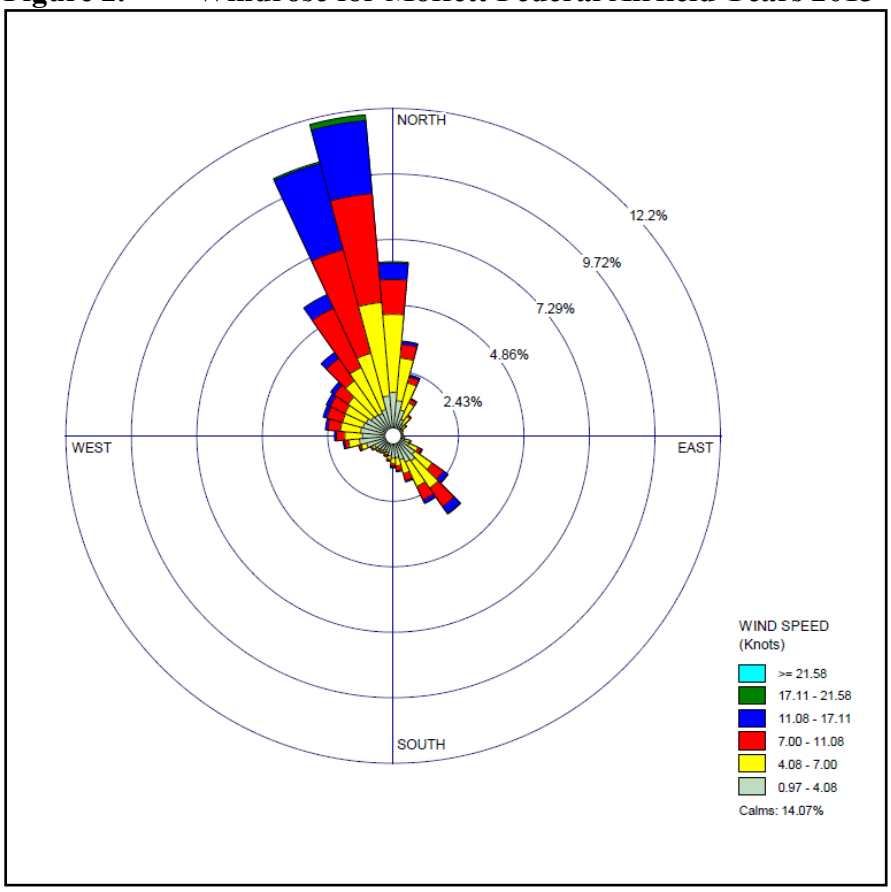
This Project is within the jurisdiction of the BAAQMD. Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants, and the number of days during which the region exceeds air quality standards, have fallen dramatically. Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons.

Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment. Climate and topography are major influences on air quality.

Climate and Meteorology

During the summer, mostly clear skies result in mild to warm daytime temperatures and cool nights in the San Francisco Peninsula. Winter temperatures are mild, except for very cool but generally frost-less mornings. Further inland where the moderating effect of the bay is not as strong, temperature extremes are greater. Rainfall amounts are modest, ranging from 13 inches in the lowlands to over 20 inches in the hills. Wind patterns are influenced by local terrain, with a northwesterly breeze in response to the sea breeze infiltrating San Francisco Bay typically developing during the daytime. Winds are usually stronger in the spring and summer. The southerly winds experienced are more common in late fall and winter. The wind rose shown in Figure 2 describes the patterns and frequency of winds at the project site. Wind data were collected from Moffett Federal Airfield for the years 2013 - 2017.

Figure 2. Windrose for Moffett Federal Airfield Years 2013 - 2017



Notes: Based on data provided by BAAQMD

NAAQS and CAAQS Status

Both the US EPA and CARB designate air basins as attainment, nonattainment, or unclassified based on ambient monitoring data. An "attainment" designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that data does not support either an attainment or nonattainment status, or that monitoring data were not available. Table 4 shows the state and federal standards for criteria pollutants and provides a summary of the attainment status for the San Francisco Bay Area.

Table 4. San Francisco Bay Area NAAQS and CAAQS Status

Pollutant	Averaging Time	State		Federal	
		Standard	Status	Standard	Status
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Mean	0.030 ppm (57 mg/m^3)	Attainment	0.053 ppm (100 µg/m^3)	Attainment
	1-Hour	0.18 ppm (338 µg/m^3)	Attainment	0.100 ppm	Unclassified
Ozone (O_3)	8-Hour	0.07 ppm (137 µg/m^3)	Nonattainment	0.070 ppm	Nonattainment
	1-Hour	0.09 ppm (180 µg/m^3)	Nonattainment	Not Applicable	Not Applicable
Suspended Particulate Matter (PM_{10})	Annual Mean	20 µg/m^3	Nonattainment	Not Applicable	Not Applicable
	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Suspended Particulate Matter ($PM_{2.5}$)	Annual Mean	12 µg/m^3	Nonattainment	12 µg/m^3	Attainment
	24-Hour	Not Applicable	Not Applicable	35 µg/m^3	Nonattainment
Sulfur Dioxide (SO_2)	Annual Mean	Not Applicable	Not Applicable	80 µg/m^3 (0.03 ppm)	Attainment
	24-Hour	0.04 ppm (105 µg/m^3)	Attainment	365 µg/m^3 (0.14 ppm)	Attainment
	1-Hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	Attainment
Lead (Pb) is not listed in the above table because it has attained the NAAQS/CAAQS since the 1980s. ppm = parts per million, mg/m^3 = milligrams per cubic meter, µg/m^3 = micrograms per cubic meter					

Source: Bay Area Air Quality Management District, 2017. *Air Quality Standards and Attainment Status.* January 5.

Criteria Pollutant Concentrations

BAAQMD monitors air pollution at various sites within the airshed. The closest air monitoring station is approximately 18 miles southeast of the project site in the City of San José (158 Jackson Street). It has monitored O_3, CO, NO, NO_2, PM_{10}, and $PM_{2.5}$ over the past 5 years (2017 through 2021). The data shows over the past few years, the specific plan area has exceeded the state and/or federal O_3, PM_{10}, and $PM_{2.5}$ ambient air quality standards. Table 5 lists air quality trends in data collected for the past 5 years and published by the BAAQMD and CARB for the Jackson Street monitoring location, which is the most recent time-period available. Note these concentrations were influenced by smoke from wildfires.

Table 5. Ambient Air Quality Concentrations from 2017 through 2021

Pollutant	Standard	2017	2018	2019	2020	2021
Ozone						
Max 1-hr concentration		121 ppb	78 ppb	95 ppb	106 ppb	98 ppb
No. days exceeded: CAAQS	3	0	1	1	3	1
Max 8-hr concentration		99 ppb	61 ppb	82 ppb	86 ppb	85 ppb
No. days exceeded: CAAQS	4	0	2	2	4	2
NAAQS	4	0	2	2	4	2
Carbon Monoxide						
Max 1-hr concentration		2.1 ppm	2.5 ppm	1.7 ppm	--	--
No. days exceeded: CAAQS	0	0	0	--	--	--
NAAQS	0	0	0	--	--	--
Max 8-hr concentration		1.8 ppm	2.1 ppm	1.3 ppm	1.3 ppm	--
No. days exceeded: CAAQS	0	0	0	0	--	0
NAAQS	0	0	0	0	--	0
PM_{10}						
Max 24-hr concentration		70 µg/m^3	122 µg/m^3	77 µg/m^3	137 µg/m^3	45 µg/m^3
No. days exceeded: CAAQS	6	4	4	10	0	10
NAAQS	0	0	0	0	0	0
Max annual concentration		21 µg/m^3	23 µg/m^3	19 µg/m^3	25 µg/m^3	20
No. days exceeded: CAAQS	-	-	-	-	-	-
$PM_{2.5}$						
Max 24-hr concentration		50 µg/m^3	134 µg/m^3	34 µg/m^3	121 µg/m^3	38 µg/m^3
No. days exceeded: NAAQS	6	16	0	12	1	12
Annual Concentration		9.5 µg/m^3	12.7µg/m^3	9.0µg/m^3	11.5 µg/m^3	8.9 µg/m^3
No. days exceeded: CAAQS	12 µg/m^3	-	-	-	-	-
NAAQS	12 µg/m^3	-	-	-	-	-
Nitrogen Dioxide						
Max 1-hr concentration		68 ppb	86 ppb	60 ppb	52 ppb	-
No. days exceeded: CAAQS	0	0	0	0	-	0
NAAQS	0	0	0	0	-	0
Annual Concentration		12 ppb	12 ppb	11 ppb	10 ppb	-
No. days exceeded: CAAQS	0.030 ppm	-	-	-	-	-
NAAQS	0.053 ppm	-	-	-	-	-

Source: Bay Area Air Quality Management District, 2020, Web: https://www.baaqmd.gov/about-air-quality/air-quality-summaries. California Air Resource Board, 2021, Web: https://arb.ca.gov/adam/select8/sc8start.php

Ozone and $PM_{2.5}$, are the major regional air pollutants of concern in the San Francisco Bay Area. Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High ozone levels are caused by the cumulative emissions of ROG and NO_X. Controlling the emissions of these precursor pollutants is the focus of BAAQMD's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. Ozone frequently forms on hot summer days when the prevailing seasonal northerly winds carry ozone precursors southward across the county.

Ozone is a regional pollutant. Emissions of ROG and NOx throughout the Bay Area contribute to ozone formation. Because emissions in one part of the region can impact air quality miles downwind, efforts to reduce ozone levels focus on reducing emissions of ROG and NOx throughout the region. The relationship between ROG and NOx in ozone formation is complex; the ratio between the precursor pollutants influences how ozone forms. BAAQMD's ozone

modeling indicates that the Bay Area is "ROG-limited" for ozone formation. This means that reducing ROG emissions in the Bay Area will be more productive in reducing ozone, at least in the near term. However, modeling also suggests that large reductions in NOx emissions will be needed to achieve the ozone reductions required to attain the current health-based ozone standards. A certain amount of ozone formation occurs naturally, even in the absence of anthropogenic emissions of ROG and NOx.[9]

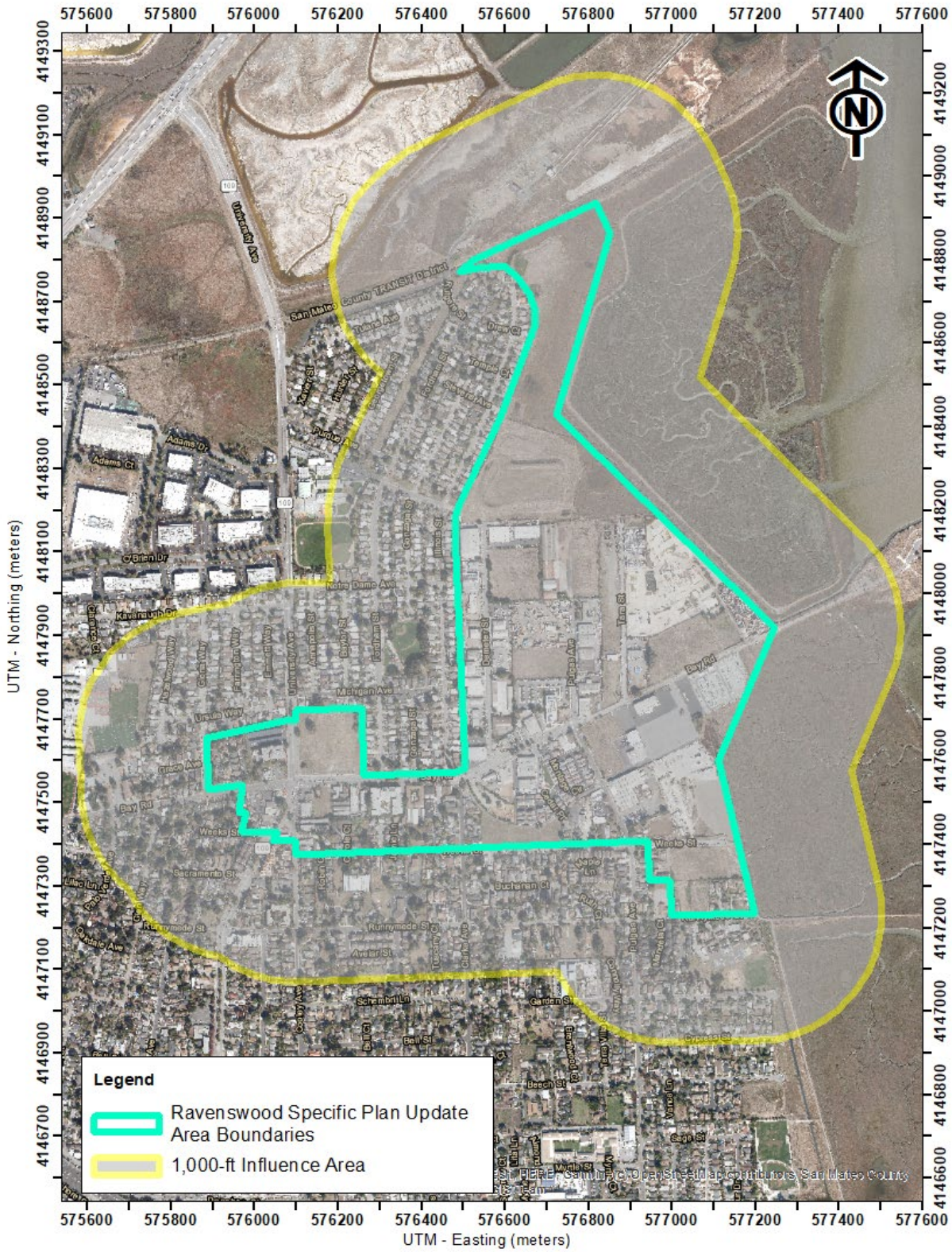
Existing Sources of TACs and Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following people who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children.

The existing developments in the Ravenswood SPU area include single-family and multi-family residential, retail, medical office, light and general industrial, and civic/institutional land uses. Sensitive receptors include locations where sensitive populations would be present for extended periods of time (i.e., chronic exposures). The project would include new residential dwellings that are considered sensitive receptors. Figure 3 shows the plan area and 1,000-foot buffer.

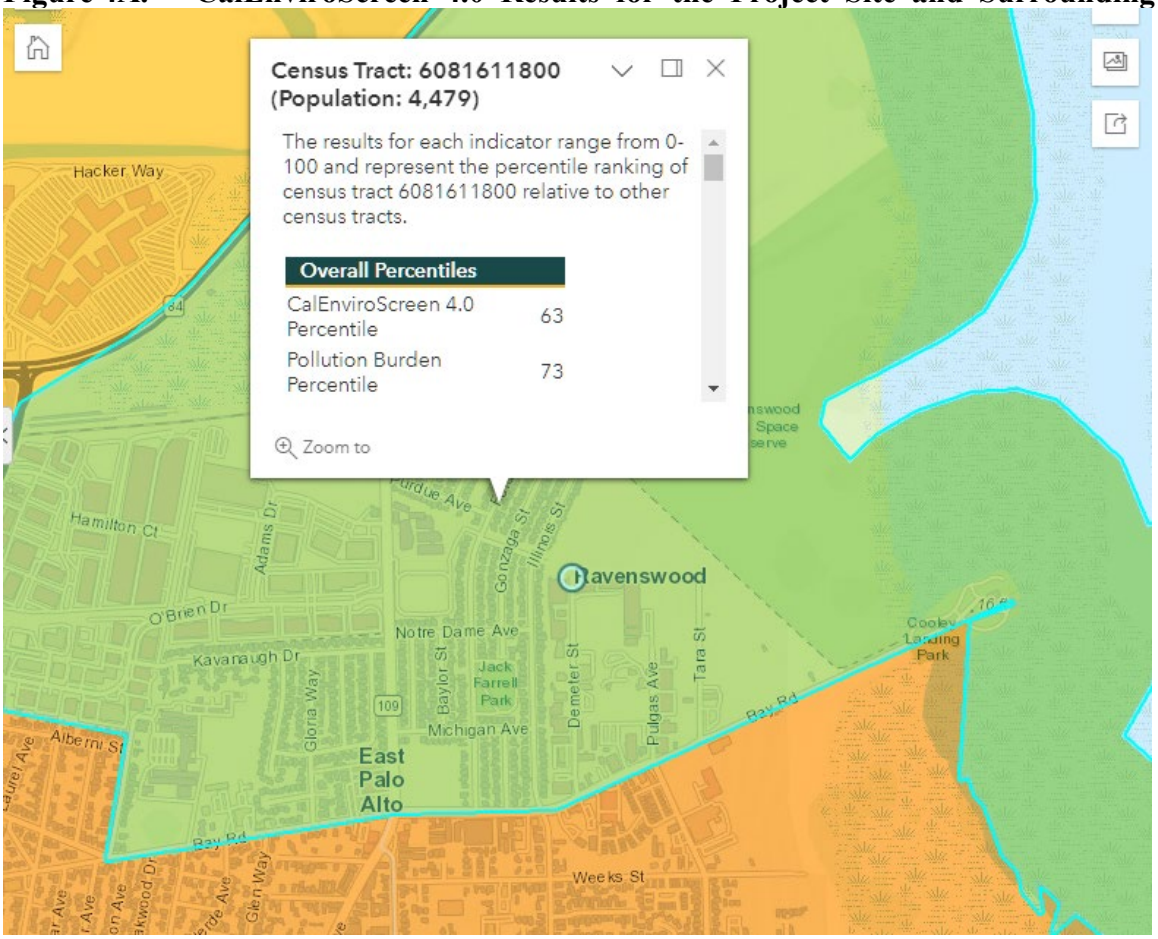
[9] Bay Area Air Quality Management District, 2017. *Spare the Air Cool the Climate Final 2017 Clean Air Plan*. April. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en

Figure 3. Ravenswood/4 Corners Specific Plan Update Project Site and 1,000-foot Area



BAAQMD has identified the planning area as an overburdened community. According to OEHHA's CalEnviroScreen tool, the census tracts containing the planning area have an overall score of 63, 75, and 77 (see Figure 4A, 4B, 4C).[10]

Figure 4A. CalEnviroScreen 4.0 Results for the Project Site and Surrounding Areas



[10] OEHAA, CalEnviroScreen 4.0 Indicator Maps https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

Figure 4B. CalEnviroScreen 4.0 Results for the Project Site and Surrounding Areas

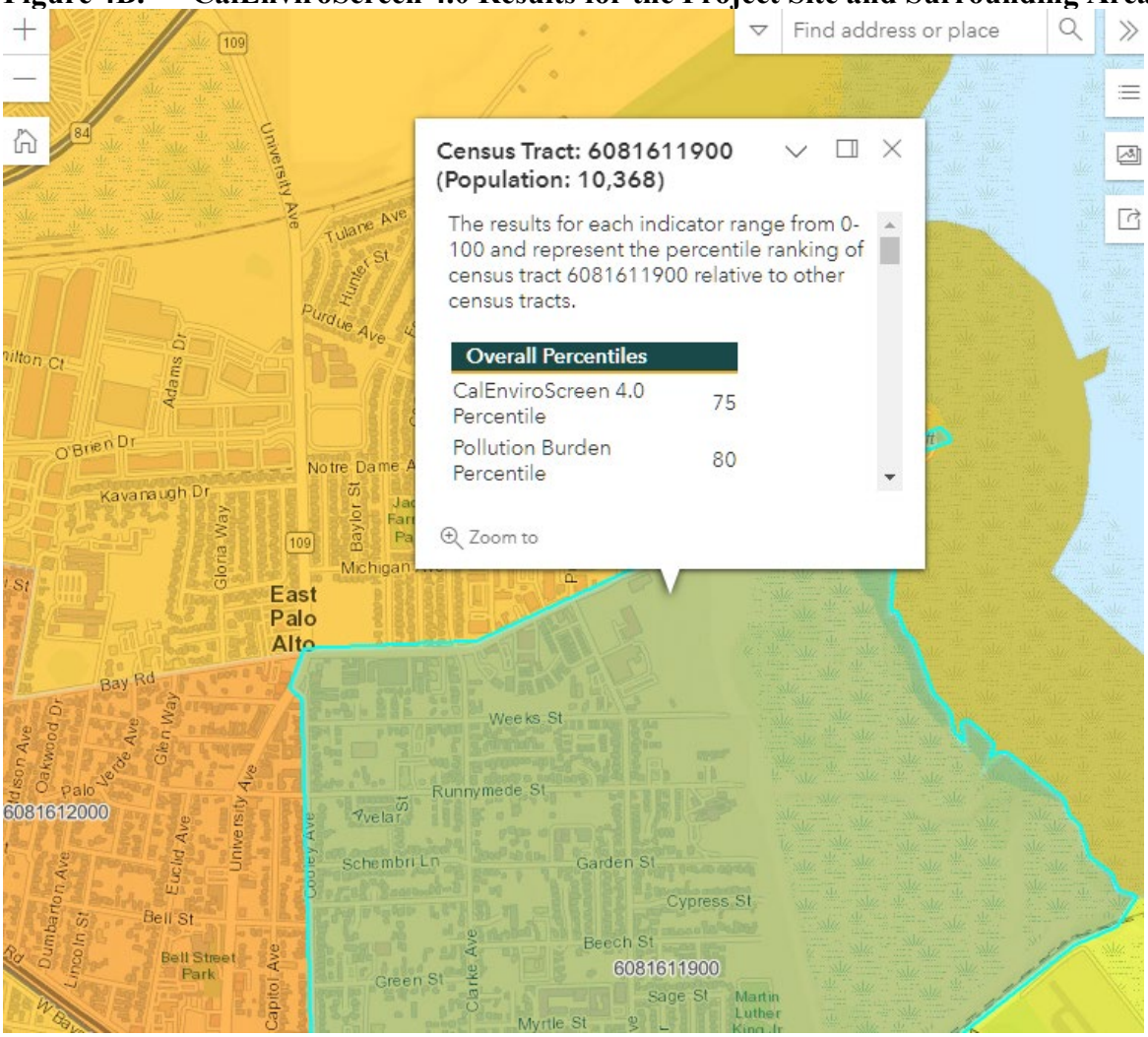
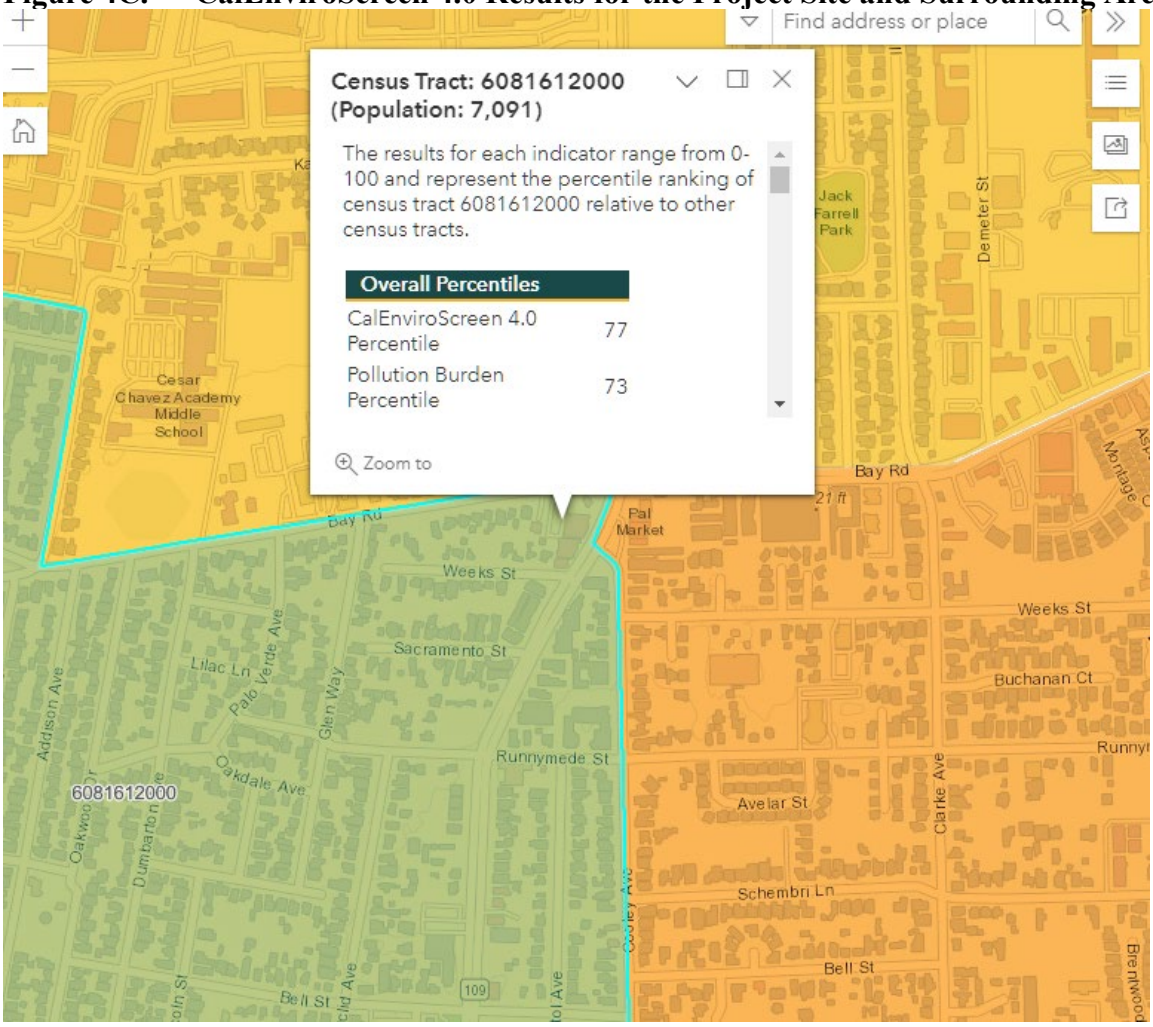


Figure 4C. CalEnviroScreen 4.0 Results for the Project Site and Surrounding Areas



PROJECT DESCRIPTION

The proposed Ravenswood SPU would increase the total amount of development allowed within the Specific Plan area by increasing the maximum square footages for office, research and development (R&D)/life science, light industrial, civic/community, and number of residential units allowed under the current Specific Plan. University Village, a single-family neighborhood located immediately east of University Avenue, is located within the current Specific Plan area, but would be removed in the SPU. Thus, no land use changes are proposed for the University Village neighborhood.

The Supplemental Environmental Impact Report (SEIR) being developed for the SPU evaluates two development scenarios:

- Scenario #1 consists of 2.82 million-sf of office and R&D and 1,350 residential units; and
- Scenario #2 consists of 3.35 million-sf of office and R&D and 1,600 residential units.

Compared to the current Specific Plan, the proposed update could result in increased allowable intensity and height for some land use designations, and a decreased allowable intensity and height

for others. Under both buildout scenarios, all proposed increases in nonresidential development square footage would occur on parcels within the Specific Plan Area that currently allow such nonresidential land uses. In contrast, the proposed Ravenswood SPU would allow for residential uses in more zones/parcels than what is allowed under the adopted 2013 Specific Plan.

Table 6 shows the proposed maximum amounts of development allowed under the two Ravenswood SPU scenarios as compared to the existing conditions and buildout totals allowed under the 2013 Specific Plan. Buildout of Scenario 1 is projected to accommodate 4,519 residents and 9,915 jobs, while Scenario 2 would accommodate 5,350 residents and 11,610 jobs. In comparison, the 2013 Specific Plan was expected to accommodate 2,793 residents and 4,851 jobs.

The proposed SPU also includes amendments to the East Palo Alto General Plan and Zoning Ordinance, that would change certain existing land use designations in the current Specific Plan Area and update existing or establish new development standards to replace current zoning provisions appliable to the Specific Plan area. The future exact allocation of that development will be determined by project-specific applications and approvals but will not exceed the totals allowed under the SPU SEIR.

Table 6: Development under Scenarios #1 and #2										
	Non-Residential (square feet)							Housing (dwelling units)		
	Office/ R&D	Office	R&D/ Lab	Light Industrial or Flex	Retail	Civic/ Community	Tenant Amenity	All	Multi-family	Single-family/ Townhouse
Existing Conditions (2022)	N/A	125,000	0	125,000	200,000	75,000	25,000	1,160	1,020	140
Existing Conditions to be Redeveloped under the Specific Plan update	N/A	65,000	0	35,000	25,000	0	0	100	100	0
Allowed Under Adopted 2013 Specific Plan	1,444,410	1,268,500	175,910	175,910	112,400	61,000	0	835	816	19
Reallocation										
	Office/ R&D	Office	R&D/ Lab	Light Industrial or Flex	Retail	Civic/ Community	Tenant Amenity	All	Multi-family	Single-family/ Townhouse
"No Project" Scenario	1,444,410	1,268,500	175,910	175,910	112,400	61,000	0	835	816	19
Scenario #1	2,824,000	1,835,600	988,400	250,000	112,400	154,700	43,870	1,350	1,270	80
Net Change #1	+1,379,590	+567,100	+812,490	+74,090	0	+96,700	+43,870	+515	+454	+61
Scenario #2	3,335,000	2,167,750	1,167,250	300,000	112,400	154,700	53,500	1,600	1,472	128
Net Change #2	+1,890,590	+899,250	+911,340	+124,090	0	+93,700	+53500	+765	+656	+109

Land Use Zones

The Ravenswood SPU includes six land use zones: (1) 4 Corners, (2) Bay Road Central, (3) Ravenswood Employment Center, (4) Industrial Transition, (5) Waterfront Office, and (6) Urban Residential.

Open Space Areas

The Ravenswood SPU would provide 44 acres of parks and open space, including 30 acres of public parks and recreational facilities/amenities, and 14 acres of preserved/restored wetlands.

Streets Network

The proposed street network for the Specific Plan area would consist of existing streets (public and private) and new streets for vehicles and/or people who walk or bike. The 2013 Ravenswood/4 Corners TOD Specific Plan EIR assumed that a new "Loop" Road would be constructed as part of the project. The new roadway would extend northward from the current termination point of Demeter Street and would turn to the west to connect with University Avenue near the East Palo Alto city limits. The new Loop Road was intended to provide a direct route between the Plan Area and University Avenue. However, the feasibility and benefits of the Loop Road are uncertain, therefore the Ravenswood SPU was analyzed with and without the Loop Road.

AIR QUALITY IMPACTS AND PROPOSED SPECIFIC PLAN UPDATE POLICIES

Air pollutant emissions and associated health risks were predicted using emissions and dispersion models. *Attachment 1* includes a detailed description of the health risk modeling methodology used in this assessment. For construction and operational land use emissions, the latest version of the California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was used to compute annual emissions, combined with motor vehicle emission factors produced by CARB's latest version of the EMFAC model, EMFAC2021 Version 1.0.1. The model output from CalEEMod along with inputs are included as *Attachment 2* and EMFAC2021 vehicle emissions modeling outputs are included in *Attachment 3*. Dispersion modeling was conducted using the U.S. EPA's AERMOD dispersion model.

Impact AIR-1: Conflict with or obstruct implementation of an applicable air quality plan?

BAAQMD, with assistance from Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC), has prepared and implements specific plans to meet the applicable laws, regulations, and programs. The most recent and comprehensive of which is the *Bay Area 2017 Clean Air Plan*.[11] The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use

[11] Bay Area Air Quality Management District (BAAQMD), 2017. *Final 2017 Clean Air Plan.*

planning affects vehicle travel, which in turn affects region-wide emissions of air pollutants and GHGs.

Consistency of the SPU with Clean Air Plan control measures is demonstrated by assessing whether the proposed SPU implements the applicable Clean Air Plan control measures. The 2017 Clean Air Plan includes control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. The control measures are divided into five categories that include:

- 40 measures to reduce stationary and area sources;
- 8 mobile source measures;
- 23 transportation control measures (including land use strategies);
- 4 building sector measures;
- 2 energy sector measures;
- 4 agriculture sector measures;
- 3 natural and working lands measures;
- 4 waste sector measures;
- 2 water sector measures; and
- 3 super-GHG pollutants measures.

In developing the control measures, BAAQMD identified the full range of tools and resources available, both regulatory and non-regulatory, to develop each one. This approach relies upon lead agencies to assist in implementing some of the control measures. A key tool for local agency implementation is the development of land use policies and implementing measures that address new development or redevelopment in local communities. To address this impact, the SPU's effect on implementing the Clean Air Plan is evaluated based on consistency with Clean Air Planning projections (i.e., rate of increase in population versus vehicle travel).

Consistency with Clean Air Plan Projections

The BAAQMD, with assistance from ABAG and MTC, has prepared and implemented the Clean Air Plan to meet the applicable laws, regulations, and programs. The primary goals of the Clean Air Plan are to attain air quality standards, reduce population exposure and protect public health, and reduce GHG emissions and protect the climate. The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which in turn affects region-wide emissions of air pollutants and GHG.

Table 7 provides the Ravenswood SPU population and traffic conditions for existing and future build out conditions. Land use and zoning changes to accommodate the Ravenswood SPU under each proposed scenario would result in an increase of new jobs and the addition of new residents (except for the baseline scenario) to the area. Compared to existing conditions, the proposed Ravenswood SPU under each scenario would increase daily trip traffic which results in additional daily vehicle miles traveled (VMT). BAAQMD CEQA Guidelines recommend considering the increase in the rate of population compared to the rate of traffic (e.g., VMT or trips) for evaluating

the significance of air quality impacts associated with the SPU. The increased VMT with respect to population growth under the Ravenswood SPU would be a significant impact when compared to the existing conditions because the rate of VMT per service population increases under all of the SPU scenarios.

However, the Ravenwood FEIR for the Adopted 2013 Specific Plan (i.e., baseline scenario) also had a significant and unavoidable impact because the Adopted 2013 Specific Plan would increase VMT at a greater rate than population growth. As shown in Table 7, the Proposed Ravenswood SPU Scenarios #1 and #2 have a lesser net change compared to existing conditions for the VMT per service population rate than the baseline scenario. This means that impacts under the Proposed Ravenswood SPU Scenarios #1 and #2 would be less than that of the Adopted 2013 Specific Plan.

Table 7. Ravenswood/4 Corners Specific Plan Update Traffic and Population Projections

Scenario	Population	Jobs	Daily VMT		VMT per Service Population	
			Loop	No Loop	Loop	No Loop
Existing Development	32,278	4,626	466,222	466,222	12.63	12.63
Allowed Development under the Adopted 2013 Specific Plan (Baseline)	2,894	5,366	118,243	118,243	14.32	14.32
Change compared to existing	*-29,384*	*+740*	*-347,979*	*347,979*	***+12%***	***+12%***
Allowed Development under the Proposed Ravenswood SPU Scenario #1	4,519	9,914	191,460	191,460	13.27	13.27
Change compared to existing	*-27,759*	*+5,288*	*-274,762*	*-274,762*	***+5%***	***+5%***
Allowed Development under the Proposed Ravenswood SPU Scenario #2	5,352	11,609	216,157	216,157	12.74	12.74
Change compared to existing	*-26,926*	*+6,983*	*-250,065*	*-250,065*	***+1%***	***+1%***

Source: Project Description and Hexagon Transportation Consultants, 2023.

Consistency with Clean Air Plan Control Measures

The BAAQMD CEQA Air Quality Guidelines establish criteria for determining consistency with the Clean Air Plan control measures. In general, a plan is considered consistent if a) the plan supports the primary goals of the Clean Air Plan; b) includes control measures; and c) does not interfere with implementation of the Clean Air Plan measures. Growth under the SPU is considered sustainable since it is a plan for infill development that would be transit-oriented and located near a mix of uses that include employment and services. The Ravenswood SPU would add housing to the area that is currently predominantly commercial and industrial uses. The City of East Palo Alto relies on measures in its adopted Climate Action Plan (CAP) to guide new development to meet GHG reduction goals. These goals are also in line with Clean Air Plan control measures. The development in the Ravenswood area under the proposed SPU is consistent with the City's General Plan and would generally be consistent with Clean Air Plan measures intended to reduce automobile and energy use. Table 8 lists those Clean Air Plan measures relevant to the SPU and indicates consistency between the City's General Plan and the Clean Air Plan.

Table 8. BAAQMD Control Strategy Measures from the Clean Air Plan

Applicable BAAQMD Control Strategy Measures	Consistency
Transportation Control Measures	
TR1: Clean Air Teleworking Initiative	Consistent Supported by General Land Use and Urban Design policy LU 2.19.
TR2: Trip Reduction Programs	Consistent Supported by General Plan Transportation policies T-3 3.1 T-5 5.1, 5.2, 5.3, 5.6, 5.9, T-7 7.1, 7.2, and T-8 8.1, 8.2 as well as Land Use and Urban Design policy LU-2 2.19.
TR 5: Transit Efficiency and Use	Consistent While this is mostly a regionally implemented control measure, General Plan Land Use and Urban Design policies LU-13 13.12, LU-17 17.10, as well as Transportation policies T-5 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.8, and 5.9 and T-7 7.3. Also supported by CAP measure TL-2.1.
TR7: Safe Routes to Schools and Safe Routes to Transit	Consistent Supported by General Plan Land Use and Urban Design policy LU-8 8.8 and Health and Equity policies HE-5 5.1, 5.2, 5.4. Also supported by Transportation policies T-1 1.3, T-4 4.1 and CAP measure TL-3.2
TR8: Ridesharing, Last-Mile Connection	Consistent Supported by General Plan Transportation policy T-5 5.4 and CAP measure TL-2.1 and TL-2.2.
TR9: Bicycle and Pedestrian Access and Facilities	Consistent Supported by General Plan Land Use and Urban Design policies LU-2 2.15, LU-8 8.8, LU-9 9.1, LU-17 17.3. 17.5, 17.13, as well as Transportation policies T-2 2.2, 2.6, 2.18, T-3 3.3, T-4 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, and 4.8. Also supported by CAP measure TL-3.1.
TR10: Land Use Strategies	Consistent Supported by General Plan Land Use and Urban Design policies LU-1 1.1, 1.5, 1.6 as well as Health and Equity policy HE-10 10.1. Also supported by CAP measures TL-1.1, TL-1.2.
TR13: Parking Policies	Consistent Supported by General Plan Transportation policies T-6 6.1, 6.2, 6.3, 6.4, T-9 9.2, 9.7 as well as Land Use and Urban Design policies LU-2 2.10, LU-13 13.10, and LU-14 14.11.
Building Control Measures	

Applicable BAAQMD Control Strategy Measures	Consistency
BL1: Green Buildings	Consistent Supported by General Plan Land Use Urban Design policies LU-4 4.5 as well as Parks Open Space, and Conservation policies POC-7 7.1, 7.2, 7.4, POC-8 8.4, 8.8, 8.9, 8.10, 8.11 along with CAP measures E-1.1, E-1.2, and MU-1.3.
BL2: Decarbonize Buildings	Consistent Supported by General Plan Land Use and Urban Design policies LU-4 4.5, as well as Parks, Open Space and Conservation policies POC-7 7.1, 7.2, 7.3, 7.4, and POC-8 8.4, 8.9. Also supported by CAP measures E-1.4, E-2.1, E-2.2, MU-1.2, and MU-1.3.
BL4: Urban Heat Island Mitigation	Consistent Supported by General Plan Parks, Open Space and Conservation policies POC-8 8.2, 8.3 as well as CAP measure TL-4.1.
Natural and Working Lands Control Measures	
NW2: Urban Tree Planting	Consistent Supported by General Plan Land Use and Urban Design policies LU-9 9.9, 9.10, LU-15 15.2 as well as Parks, Open Space and Conservation policies POC-6 6.2, 6.3, 6.4, and POC-8 8.2.
Waste Management Control Measures	
WA4: Recycling and Waste Reduction	Consistent Supported by General Plan Health and Equity policy HE-10 10.5, as well as Parks, Open Space and Conservation policies POC-8 8.12, POC-9 9.11 and Infrastructure, Services and Facilities policies ISF-4 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9. Also supported by CAP measures W-1.1, W-2.1, W-2.2, and W-3.1.
Water Control Measures	
WR2: Support Water Conservation	Consistent Supported by General Plan Infrastructure, Services, and Facilities ISF-1 1.2, 1.4, 1.5, 1.8, ISF-2 2.1, 2.2, 2.4, 2.6, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13 as well as CAP Measure E-1.3.

Impact AIR-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?

The Bay Area is considered a nonattainment area for ozone and $PM_{2.5}$ under both the NAAQS and the CAAQS and nonattainment for PM_{10} under the CAAQS only. The area has attained the NAAQS and CAAQS for CO. As part of an effort to attain and maintain the NAAQS/CAAQS for ozone and PM_{10}, the BAAQMD has established CEQA thresholds of significance for these air

pollutants and their precursors (ROG, NO_X, PM_{10}, and $PM_{2.5}$). These thresholds apply to both construction period and operational period impacts. The quantified thresholds identified by BAAQMD apply only to projects.

Construction Emissions

Build-out of the proposed Ravenswood SPU would result in temporary emissions from construction activities associated with subsequent development, including demolition, site grading, asphalt paving, building construction, and architectural coating. Emissions commonly associated with construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips.

Fugitive dust, the dominant source of PM_{10} and $PM_{2.5}$ emissions during construction, is generated when wheels or blades disturb surface materials. Sources of fugitive dust include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. Uncontrolled dust from construction activities can become a nuisance and potential health hazard to those living and working nearby.

Exhaust emissions include those from construction equipment (i.e., off-road) and traffic (on-road vehicles and trucks). Off-road construction equipment is often diesel-powered and can be a substantial source of NO_X emissions, in addition to PM_{10} and $PM_{2.5}$ emissions. Architectural coatings and application of asphalt pavement are dominant sources of ROG emissions. The potential health risk impacts from construction is addressed under Impact 3.

Emissions associated with all of the projects that would be constructed under the Ravenswood SPU would exceed the significance thresholds. However, the pollutant emissions thresholds for construction contained in BAAQMD's CEQA Air Quality Guidelines only apply to projects and not plans. Buildout of the Ravenswood SPU would consist of numerous construction projects that would occur at various times over the next 20 years. The details of these individual construction projects are not available to make valid estimates of construction emissions impacts for the Ravenswood SPU. Therefore, project construction emissions should be analyzed individually and compared to BAAQMD thresholds .

Ravenswood SPU AQ-1: Require Future Construction Projects to Estimate Construction Period Emissions. Projects shall estimate construction period emissions using modeling methodologies recommended by BAAQMD and approved by the City.

Average daily emissions predicted for construction projects shall be estimated and compared against Project level thresholds identified in Table 3. Projects that have emissions exceeding the BAAQMD CEQA thresholds shall implement appropriate measures to achieve emissions that are below the thresholds.

Ravenswood SPU AQ-2: **Implement appropriate measures recommended by BAAQMD to reduce construction period emissions.** Measures to reduce DPM and PM_{10} from construction are recommended to ensure that short-term health impacts to nearby sensitive receptors are avoided. BAAQMD recommends basic construction mitigation measures for all projects and additional enhanced measures for projects with construction emissions above significance thresholds.

The BAAQMD's CEQA Air Quality Guidelines consider construction impacts to be less-than-significant if best management practices (BMPs) are implemented to reduce fugitive dust emissions and construction related exhaust emissions. Implementation of BAAQMD's BMPs are required by the City's General Plan and included as a mitigation measure in the General Plan EIR.

<u>BAAQMD's Basic Construction BMPs</u>

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

4. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.

7. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.

8. Unpaved roads providing access to sites located 100 feet or further from a paved road shall be treated with a 6- to 12-inch layer of compacted layer of wood chips, mulch, or gravel.

9. Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

<u>BAAQMD's Enhanced Construction BMPs</u>

All basic measures, as described above, plus:

1. Limit the simultaneous occurrence of excavation, grading, and ground-disturbing construction activities.

2. Install wind breaks (e.g., trees, fences) on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.

3. Plant vegetative ground cover (e.g., fast-germinating native grass seed) in disturbed areas as soon as possible and watered appropriately until vegetation is established.

4. Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.

   Minimize the amount of excavated material or waste materials stored at the site.

6. Hydroseed or apply non-toxic soil stabilizers to construction areas, including previously graded areas, that are inactive for at least 10 calendar days.

Effectiveness of Ravenswood SPU AQ-1 and AQ-2:

These measures are consistent with recommendations in the BAAMQD CEQA Guidance for basic and enhanced measures to control construction emissions from projects. All projects shall implement BAAQMD's basic BMPs. The need for enhanced measures shall be determined through a project-level construction emissions analysis as required by AQ-1.

Ravenswood SPU AQ-3: Use Construction equipment that has zero or low diesel particulate matter exhaust and NOx emissions.

Implement additional controls to reduce emissions for projects with construction emissions exceeding thresholds. Equipment exhaust emission (NOx and PM) control measures include:

1. All construction equipment larger than 25 horsepower used at the site for more than two continuous days or 20 hours total shall meet U.S. EPA Tier 4 emission standards for NOx and PM (PM_{10} and $PM_{2.5}$), if feasible, otherwise,

   a. If use of Tier 4 equipment is not available, alternatively use equipment that meets U.S. EPA emission standards for Tier 2 or 3 engines and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices that altogether achieve a 85-percent reduction in particulate matter exhaust in comparison to uncontrolled equipment; alternatively (or in combination).

   b. Use of alternatively fueled equipment with lower NOx emissions that meet the NOx and PM reduction requirements above.

   c. Special equipment that cannot meet the above requirements must be approved as exempt by the City after considering reasons for requesting an exemption.

d. Use portable electrical equipment where commercially available and practicable to complete construction. Construction contractors shall utilize electrical grid power instead of diesel generators when (1) grid power is available at the construction site; (2) when construction of temporary power lines are not necessary in order to provide power to portions of the site distant from existing utility lines; (3) when use of portable extension lines is practicable given construction safety and operational limitations; and (4) when use of electrical grid power does not compromise construction schedules.

2. Diesel engines, whether for off-road equipment or on-road vehicles, shall not be left idling for more than 2 minutes, except as provided in exceptions to the applicable state regulations (e.g., traffic conditions, safe operating conditions). The construction sites shall have posted legible and visible signs in designated queuing areas and at the construction site to clearly notify operators of idling limit.

3. Provide line power to the site during the early phases of construction to minimize the use of diesel-powered stationary equipment.

4. The City shall encourage the use of zero emission construction equipment.

Effectiveness of Ravenswood SPU AQ-3:

In general, a construction project using construction equipment with engines that meet Tier 4 Final emissions standards reduce ROG emissions by about 5 percent, NOx emissions by over 50 percent, and PM_{10} exhaust emissions by over 80 percent when compared to equipment that reflects the statewide fleet.

Ravenswood SPU AQ-4: Require use of low VOC coatings to reduce ROG emissions.

Projects with ROG emission that exceed thresholds shall use low volatile organic compound or VOC (i.e., ROG) coatings, that are below current BAAQMD requirements (i.e., Regulation 8, Rule 3: Architectural Coatings), for at least 80 percent of all residential and nonresidential interior paints and 80 percent of exterior paints. This includes all architectural coatings applied during both construction and reapplications throughout the project's operational lifetime. At least 80 percent of coatings applied must meet a "super-compliant" VOC standard of less than 10 grams of VOC per liter of paint. For reapplication of coatings during the project's operational lifetime, the Declaration of Covenants, Conditions, and Restrictions shall contain a stipulation for low VOC coatings to be used. Examples of "super-compliant" coatings are contained in the South Coast Air Quality Management District's website.[12]

Effectiveness of Ravenswood SPU AQ-4

The effectiveness of Ravenswood SPU AQ-4 could reduce ROG coating emissions by 70 percent with Ravenswood SPU AQ-4 using 80 percent interior and exterior super-compliant VOC coatings.

Significance After Implementation of Ravenswood SPU AQ-1, AQ-2, AQ-3, and AQ-4

The impact would be considered less-than-significant with the implementation of the above mitigation. Given that specific construction details are not available at this time to properly model emissions, future projects in Ravenswood SPU area would be required to complete supplemental environmental review with a construction criteria pollutant emissions analysis to identify impacts and include measures to reduce emissions below the applicable BAAQMD construction thresholds.

Operational Buildout Emissions

Air emissions from the implementation of the Ravenswood SPU would be generated primarily from autos driven by future residents, employees, customers, and vendors and evaporative emissions from architectural coatings and maintenance products (classified as consumer products). CalEEMod Version 2020.4.0 was used to estimate emissions from operation of the proposed project assuming full buildout.

[12] SCAQMD: http://www.aqmd.gov/home/regulations/compliance/architectural-coatings/super-compliant-coatings

CalEEMod Land Uses

CalEEMod modeling scenarios were developed for existing uses (year 2022), the adopted Specific Plan (baseline or No Project scenario), and the scenarios proposed by the Ravenswood SPU for the buildout year 2040 were developed for. Inputs are summarized in Table 9.

Table 9. Operational Land Uses Entered into CalEEMod

Project Land Uses	Size	Units
Existing Uses (Year 2022)		
General Office Building	125.00	1,000-sf
Government (Civic Center)	75.00	1,000-sf
City Park	0.57	Acres
Regional Shopping Center	200.00	1,000-sf
Apartments Mid Rise	1,020	Dwellings
Single Family Housing	140	Dwellings
Adopted 2013 Specific Plan (No Project)		
General Office Building	1,235.65	1,000-sf
Government (Civic Center)	29.89	1,000-sf
General Office Building	23.18	1,000-sf
Research & Development	176.00	1,000-sf
Library	4.58	1,000-sf
General Heavy Industry	179.18	1,000-sf
City Park	30.00	Acres
Fast Food Restaurant w/o Drive Thru	18.10	1,000-sf
High Turnover (Sit Down Restaurant)	12.59	1,000-sf
Quality Restaurant	8.65	1,000-sf
Apartments Mid Rise	816	Dwellings
Single Family Housing	19	Dwellings
Regional Shopping Center	73.06	1,000-sf
Proposed Ravenswood SPU Scenario #1		
General Office Building	1,802.95	1,000-sf
Government (Civic Center)	75.80	1,000-sf
General Office Building	58.79	1,000-sf
Research & Development	988.40	1,000-sf
Library	11.60	1,000-sf
General Heavy Industry	263.51	1,000-sf
City Park	30.00	Acres
Fast Food Restaurant w/o Drive Thru	18.10	1,000-sf
High Turnover (Sit Down Restaurant)	12.59	1,000-sf
Quality Restaurant	8.65	1,000-sf
Apartments Mid Rise	1,270	Dwellings
Single Family Housing	80	Dwellings
Regional Shopping Center	73.06	1,000-sf
Proposed Ravenswood SPU Scenario #2		
General Office Building	2,135.10	1,000-sf
Government (Civic Center)	75.80	1,000-sf
General Office Building	58.79	1,000-sf
Research & Development	1,167.25	1,000-sf
Library	11.60	1,000-sf
General Heavy Industry	333.51	1,000-sf
City Park	30.00	Acres
Fast Food Restaurant w/o Drive Thru	18.10	1,000-sf

Project Land Uses	Size	Units
High Turnover (Sit Down Restaurant)	12.59	1,000-sf
Quality Restaurant	8.65	1,000-sf
Apartments Mid Rise	1,520	Dwellings
Single Family Housing	80	Dwellings
Regional Shopping Center	73.06	1,000-sf

Trip Generation and VMT Rates

CalEEMod allows the user to enter specific vehicle trip generation rates. Daily trip generation rates provided by the traffic consultant were entered into the model.[13] The traffic report provided trip rates for total trips per day for the Adopted 2013 Specific Plan (No Project), Proposed Ravenswood SPU Scenario #1, and Proposed Ravenswood SPU Scenario #2. These were assumed to be weekday trips. Weekend trip rates were calculated based on the ratio CalEEMod predicted weekday to Saturday and Weekday to Sunday trips. Average trip lengths were input based on the VMT forecasted in the Traffic Study for each scenario, with and without the proposed loop road. The trip generation rates and VMT provided in the traffic study reflect TDM requirements.

CT-EMFAC2021

This analysis involved the use of the CARB EMFAC2021 emissions model, known as CT-EMFAC2021. CT-EMFAC2021 provides emission factors for mobile source criteria pollutants and TACs. Emission processes modeled include running exhaust for DPM, $PM_{2.5}$, reactive organic compounds (ROG), and nitrogen oxides (NOx). All $PM_{2.5}$ emissions from all vehicles were used, rather than just the $PM_{2.5}$ fraction from diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from vehicle tire and brake wear from re-entrained roadway dust were included in these emissions.

Inputs to the model include region (San Mateo County), type of road (major/collector), traffic mix assigned by CT-EMFAC2021 for the county, truck percentage for non-state highways in San Mateo County (3.13 percent),[14] year of analysis (2020 and 2040), and season (annual). Using these inputs, CT-EMFAC generates emission factors in 5 mph speed bins ranging between 0 and 70+ mph. The emission factor generated for each speed bin was matched with the VMT quantities provided by the project's traffic consultant for each individual speed bin to calculate total emissions for each pollutant mentioned above.

Energy

CalEEMod defaults for energy use were used, which include the 2019 Title 24 Building Standards. Peninsula Clean Energy (PCE) is the official electricity provider for East Palo Alto and San Mateo County. Buildings within the Ravenswood SPU area were assumed to be powered by electricity using PCE as the default provider. The model has a default rate of 0 pounds of CO_2 per megawatt of electricity produced, which is based on PCE's 2019 emissions rate.

[13] Hexagon Transportation Consultants, Inc., Ravenswood Specific Plan Update Transportation Analysis, March 7, 2023.
[14] Bay Area Air Quality Management District, 2023, Appendix E of the *BAAQMD CEQA Guidance.* April.

Wood-Burning Devices

CalEEMod default inputs assume new residential construction would include woodburning fireplaces and stoves. The project would not include wood-burning devices, as these devices are prohibited by BAAQMD Regulation 6, Rule 3.[15] Therefore, the number of woodstoves and woodburning fireplaces in CalEEMod were set to zero.

Water Usage and Wastewater

CalEEMod's default water usage rates for the various land uses were used and are based on 2008 statewide averages. Water/wastewater use was changed to 100 percent aerobic conditions to represent the City's wastewater treatment plant conditions. The SPU area would not send wastewater to septic tanks or facultative lagoons.

Solid Waste

CalEEMod default values were adjusted to reflect current and future waste generation rates. From 2008 to 2016, the per person rate of waste disposed has decreased from 4.1 pounds per person to 3.6 pounds. Altogether, this represents a 15 percent decrease in the rate of solid waste generation. Waste diversion is anticipated to increase by at least another 5 percent by diverting food scraps from the landfills.

Existing Uses

Emissions associated with existing uses in the Ravenswood SPU are not included in Tables 10 and 11 and, therefore, are not being netted out of the operational emissions. This is being done to be conservative and to be consistent with the traffic analysis for the plan area.

Summary of Computed Operational Emissions

Adopted 2013 Specific Plan (No Project), Proposed Ravenswood SPU Scenario #1 (with and without loop road), and Proposed Ravenswood SPU Scenario #2 (with and without loop road) were computed using CalEEMod. Average daily emissions were calculated assuming 365 days of emissions per year.

As shown in Table 10 and Table 11, buildout emissions would exceed the BAAQMD Project-Level significance thresholds for ROG, NO_X, and PM_{10} for the Proposed Ravenswood SPU Scenarios #1 and #2.

The addition of residences proposed by the Ravenswood SPU would greatly increase consumer product ROG emissions. Additional building square footage increases the use of architectural

[15] Bay Area Air Quality Management District, https://www.baaqmd.gov/~/media/dotgov/files/rules/regulation-6-rule-3/documents/20191120_r0603_final-pdf.pdf?la=en

coatings used (e.g., painting) that also would increase ROG emissions. As a result, ROG emissions from the Ravenswood SPU area increase at maximum (i.e., compared to the Proposed Ravenswood SPU Scenarios #1 with no Loop Road) by about 200 percent over existing emissions.

The additional vehicles driven on the Ravenswood SPU roadways from a full project build-out greatly increases the NO_X and PM_{10} emissions. More vehicles on the Ravenswood SPU roadways means more VMT generated by the project, which equates to higher emissions.

When comparing Buildout emissions to BAAQMD Project-Level thresholds, the SPU would be considered to have a significant impact. Implementation of Mitigation Measure AQ-4 for projects in the SPU area would reduce the impact, but not to less-than-significant levels. There is no feasible mitigation measure to ensure consumer products (such as inks, coatings, and adhesives) used by future residents and tenants would be low in VOCs. These are primarily emissions that are directly related to the size of a development. The project's mobile ROG, NO_X, and PM_{10} emissions from office, commercial, and residential uses would be reduced to the maximum extent feasible through the TDM measures proposed by the project and required per the Ravenswood SPU as described in the TDM Plan. Some of the reduction in mobile ROG, NO_X, and PM_{10} emissions from TDM are already reflected in the project emissions reported in Table 10 and Table 11. For these reasons, operational ROG, NO_X, and PM_{10} emissions from the Ravenswood SPU are conservatively assumed to be ***significant and unavoidable***.

Table 10. Unmitigated Annual Buildout Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
Emissions Per Year (Tons)				
Unmitigated 2040 Adopted 2013 Specific Plan (No Project) Loop Annual Operational Emissions (*tons/year*)	**19.98**	**10.07**	**11.42**	2.36
Unmitigated 2040 Proposed Ravenswood SPU Scenario #1 Loop Annual Operational Emissions (*tons/year*)	**34.22**	**16.80**	**18.75**	3.90
Unmitigated 2040 Proposed Ravenswood SPU Scenario #1 No Loop Annual Operational Emissions (*tons/year*)	**34.28**	**16.89**	**18.85**	3.93
Unmitigated 2040 Proposed Ravenswood SPU Scenario #2 Loop Annual Operational Emissions (*tons/year*)	**39.58**	**19.10**	**21.19**	4.43
Unmitigated 2040 Proposed Ravenswood SPU Scenario #2 No Loop Annual Operational Emissions (*tons/year*)	**39.62**	**19.19**	**21.28**	4.45
BAAQMD Project-Level Thresholds (tons /year)	*10 tons*	*10 tons*	*15 tons*	*10 tons*
Exceed Project-Level Threshold? Unmitigated	***Yes***	***Yes***	***Yes***	*No*

Table 11. Unmitigated Buildout Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
Annualized Daily Emissions (pounds/day)[1]				
Unmitigated 2040 Adopted 2013 Specific Plan (No Project) Loop Annual Operational Emissions (*lbs./day*)	**109.49**	**55.18**	**62.58**	12.94
Unmitigated 2040 Proposed Ravenswood SPU Scenario #1 Loop Annual Operational Emissions (*lbs./day*)	**187.53**	**92.04**	**102.72**	21.39
Unmitigated 2040 Proposed Ravenswood SPU Scenario #1 No Loop Annual Operational Emissions (*lbs./day*)	**187.83**	**92.56**	**103.26**	21.51
Unmitigated 2040 Proposed Ravenswood SPU Scenario #2 Loop Annual Operational Emissions (*lbs./day*)	**216.85**	**104.67**	**116.13**	24.26
Unmitigated 2040 Proposed Ravenswood SPU Scenario #2 No Loop Annual Operational Emissions (*lbs./day*)	**217.11**	**105.17**	**116.59**	24.36
BAAQMD Project-Level Thresholds (lbs/day)	*54* lbs.	*54* lbs.	*82* lbs.	*54* lbs.
Exceed Project-Level Threshold? Unmitigated	***Yes***	***Yes***	***Yes***	*No*
Notes: [1] Assumes 365-day operation.				

Effectiveness of Ravenswood SPU AQ-4 on Buildout Emissions.

To reduce the impact of ROG emissions from architectural coatings, the project would be required to use super compliant VOC coatings. It is assumed that only the initial application of coatings could be fully controlled through this mitigation measure since future occupants may independently choose their own architectural coatings. Low VOC interior coatings were assumed to have a 50-percent reduction. Thus, implementation of Ravenswood SPU AQ-4 would reduce total buildout ROG emissions by about 5 percent. While it is feasible and enforceable for the City to require super compliant VOC coatings be applied during construction, the City cannot ensure that future occupants or tenants will use super compliant VOC coatings during reapplication.

Ravenswood SPU AQ-5: All diesel standby emergency generators powered by diesel fuel shall meet U.S. EPA Tier 4 engine standards.

Permanent stationary emergency generators installed on-site shall have engines that meet or exceed U.S. EPA Tier 4 standards for particulate matter emissions.

Effectiveness of Ravenswood SPU AQ-5 on Operational Emissions.

There are no specific details available that identify the use of diesel generators, therefore, the emissions caused by this equipment cannot be quantified and were not included in the CalEEMod analysis. The primary pollutant emitted by generators is NOx, which is estimated to be below BAAQMD's CEQA project-level threshold. Implementation of this mitigation measure would ensure that NOx and DPM emissions are reduced by 85 percent compared to Tier 2 engines that could be allowed.

Significant Emissions from SPU Buildout

When evaluated using the project-level thresholds contained in the 2017 version of the BAAQMD CEQA Air Quality Guidelines, buildout of the SPU would have significant emissions of ozone precursor pollutants (i.e., ROG & NO_X) and PM_{10} during operation. These emissions cannot be feasibly reduced further, as the proposed Ravenswood SPU scenarios include all reasonable and feasible features and mitigation measures to minimize these emissions. Such features include a mix-use project near transit, implementation of an enhanced TDM plan, and mitigation measures to reduce evaporative ROG emissions from architectural coatings. Emissions of ROG associated with consumer product usage is the overwhelming contributor to ROG emissions associated with the SPU buildout. NO_X and PM_{10} emissions are primarily from vehicles, specifically their exhaust, fugitive road dust, brake wear, and tire wear. These emissions cannot be controlled to a level of less-than-significant by the proposed Ravenswood SPU.

Significant emissions of these pollutants result in a cumulatively considerable net increase of criteria pollutants for which the region is in nonattainment under an applicable ambient air quality standard. Because the SPU buildout would have emissions of ROG and NO_X that would exceed BAAQMD's project-level emission-based significance thresholds, the project would result in a cumulatively considerable net increase in pollutant emissions that contribute to elevated ozone concentrations that exceed ambient air quality standards.

Airborne particulate matter (PM) concentrations found in the Bay Area are not a single pollutant, but rather is a mixture of many chemical species. It is a complex mixture of solids and aerosols composed of small droplets of liquid, dry solid fragments, and solid cores with liquid coatings. Those with a diameter of 10 microns or less (PM_{10}) are inhalable into the lungs and can induce adverse health effects like coughing, wheezing, asthma attacks, heart attack, and more. These impacts are mostly likely to affect the elderly and the very young. In our climate, particulate matter can both warm and cool our climate depending on the mixture emitted into the atmosphere. Further, particulate matter from metal and organic compounds can alter plant growth and yield. Emissions of particulate matter in the Bay Area contribute to these effects both in the Bay Area and for miles downwind. While emissions of particulate matter have been reduced in the Bay Area

in recent decades, further reduction is necessary to continue the improvements seen in the public health benefits in the Bay Area[16].

As previously stated, air pollution by its nature is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality is considered significant. In developing CEQA thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions.

By comparing emissions from the SPU buildout to those of the airshed, one gets the sense of the magnitude of the project effects on regional air quality. In terms of each exceeding pollutant, unmitigated Ravenswood SPU buildout emissions are a small portion of the region's total emissions, representing 0.04 percent, 0.04 percent, and 0.06 percent for each respective pollutant as shown in Table 12. Thus, the effect of the SPU would not cause regional ROG, NO_X, and PM_{10} levels to measurably change. As a result, the project would not measurably increase ozone levels. Therefore, the health effects associated with the SPU would not be measurable. However, buildout of the SPU would increase ROG, NO_X, and PM_{10} emissions above the BAAQMD's project-level thresholds, making those impacts cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions.

Table 12. Comparison of Project Emissions to Air Basin Emissions[17]

Scenario	ROG	NO_X	PM_{10}
Bay Area Air Basin in 2020	238 tons/day	172 tons/day	90 tons/day
Bay Area Air Basin in 2035[1]	238 tons/day	140 tons/day	98 tons/day
Unmitigated Maximum Project Operation Scenarios	0.11 tons/day (40 tons/year)	0.05 tons/day (19 tons/year)	0.06 tons/day (21 tons/year)
% of Basin in 2035-40	*0.04%*	*0.04%*	*0.06%*

[1] CARB emission inventories are only reported out to year 2035, which is the closest year of analysis to proposed Project operational year.

Impact AIR-3: Expose sensitive receptors to substantial pollutant concentrations?

To address exposure of sensitive receptors to substantial pollutant levels, the BAAQMD CEQA Guidelines developed thresholds that address health risks. These include increased cancer risk, non-cancer hazards, and increased annual concentrations of $PM_{2.5}$. Diesel particulate matter (DPM) is the predominant TAC in the area.

[16] Understanding Particulate Matter: Protecting Public Health in the San Francisco Bay Area. URL: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/PM%20Planning/ParticulatesMatter_Nov%207.ashx

[17] CARB. 2024. CEPAM2019v1.03 Emission Projection Data. See https://ww2.arb.ca.gov/applications/emissions-user-defined-query accessed May 21, 2024 to estimate year 2020 and 2035 emissions.

As previously described, the East Palo Alto General Plan Update FEIR includes a mitigation measure requiring project-level construction health risk assessments. This would apply to projects in the SPU.

Individual projects within the SPU area would introduce new sources of TACs with the potential to adversely affect existing sensitive receptors in the vicinity of the SPU area or by significantly exacerbating existing cumulative TAC impacts. Construction activity would generate dust and equipment exhaust that would affect nearby sensitive receptors. Operation of the new Ravenswood SPU developments would increase traffic in the area that would increase the air pollutant and TAC emissions in the area. In addition, the new buildings may include the installation of emergency generators powered by diesel engines and cooling towers that would also have TACs and air pollutants emissions.

Health risk impacts to existing sensitive receptors were addressed qualitatively for temporary construction activities since specific construction plans and schedules for projects in the Ravenswood SPU are not available. Health risk from long-term operation was based on traffic increases by modeling the impact from the primary roadways that are near sensitive receptors. Individual development projects may include stationary sources of emissions such as generators and cooling towers. However, the land uses that utilize these sources would not be located near existing sensitive receptors. Furthermore, these types of sources would be required to obtain permits from BAAQMD and undergo project-level health risk analyses.

There are several sources of existing TACs and $PM_{2.5}$ within and near the Ravenswood SPU area. The risks associated with these existing pollutant sources were assessed.

Health Risks from Project Construction

Subsequent activities associated with implementation of the Ravenswood SPU would include construction projects that would be sources of TACs. Existing sensitive receptors are located west and south of the Ravenswood SPU area. Buildout of Ravenswood SPU would also introduce new sensitive receptors that would be exposed to emissions from construction activity.

Health risks to nearby off-site and future on-site sensitive receptors associated with temporary construction near Ravenswood SPU are considered *potentially significant*. Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. The construction exhaust emissions may pose community risks for sensitive receptors such as nearby residents. The primary health risks associated with construction emissions are cancer, exposure to $PM_{2.5}$, and non-cancer health hazards. Diesel exhaust (i.e., DPM) poses both a potential health risk and nuisance impact to nearby receptors. A health risk assessment specific to each project are needed to determine these impacts. Since specific construction plans and schedules for each project in the SPU area are not known, it is not possible to quantify the impacts and determine their significance. The existing mitigation measures identified in the City's general Plan and those in the current Specific Plan would be incorporated into construction plans (e.g., site watering, equipment selection, phasing, etc....) and would minimize potential impacts from construction.

Health Risks from Plan Buildout

Buildout of the SPU would generate emissions from mobile sources (e.g., traffic) and stationary sources (e.g., generators). While these emissions would not be as intensive as construction activity, they would contribute to long-term effects to new and existing sensitive receptors.

Buildout Traffic

The Ravenswood SPU traffic volumes on the roadways within 1,000 feet of the surrounding area were used to assess buildout health risks.[18] For this analysis, the traffic volumes were assumed to be generated from the buildout of the Ravenswood SPU on a given roadway. Ravenswood SPU trips were assumed to occur on University Avenue, Bay Road, and Clarke Avenue. Trips would occur on other roadways too, but these roadways were found to accommodate the majority of the Buildout traffic. The following Ravenswood SPU-generated traffic volumes were used for modeling each roadway:

- University Avenue: 2,720 vehicles
- Bay Road: 7,755 vehicles
- Clarke Avenue: 2,509 vehicles

Average hourly traffic distributions for San Mateo County roadways were developed using the EMFAC model,[19] which were then applied to the ADT volumes and roadway lengths (in miles) to obtain estimated hourly vehicle miles of travel (VMT) and emissions for the roadway. For all hours of the day an average speed of 25 mph on University Avenue, Bay Road, and Clarke Avenue was assumed for all vehicles based on posted speed limit signs on the roadways.

TAC Emissions from Traffic

Emissions were estimated for DPM, organic TACs (i.e., total organic gases [TOG]) , and $PM_{2.5}$ for traffic on each roadway using the latest version of CARB's EMFAC emissions model (EMFAC2021).

EMFAC2021 includes the latest data on California's car and truck fleets and produces emissions rates for either specific vehicle categories or aggregate emissions rates using county-wide vehicle populations. However, the rates produced are only for criteria pollutants, not TACs or DPM. Therefore, CT-EMFAC2017 was also used to aid in the development of emissions rates used in the analysis.

CT-EMFAC2017 is the Caltrans version of the CARB's EMFAC2017 emissions model and provides emission factors for mobile source criteria pollutants and TACs, including DPM, based on specific truck fractions input by the user. CT-EMFAC2017 uses the fraction of Non-Truck vehicles and trucks (i.e., Truck 1 and Truck 2) to develop aggregate emissions factors for each of

[18] Hexagon Transportation Consultants, Inc., Ravenswood Specific Plan Update Transportation Analysis, March 7, 2023.

[19] The Burden output from EMFAC2007, a previous version of CARB's EMFAC model, was used for this since the current web-based version of EMFAC2021 does not include Burden type output with hour by hour traffic volume information.

15 speed bins. The truck percentage derived from Caltrans' truck census program (4.6 percent – 3.3 percent Truck 1 and 1.3 percent Truck 2) was input into CT-EMFAC2017 to develop emissions factors.

Next, the ratio of DMP to $PM_{2.5}$ produced by CT-EMFAC2017 was used to derive a DPM emissions rate using EMFAC2021 rates for each speed needed. Emission processes modeled for the analysis include running exhaust and evaporative emissions for $PM_{2.5}$, DPM, and TOG. Fugitive $PM_{2.5}$ emissions were also estimated using the road dust emissions factors provided by CT-EMFAC2017 and the tire wear and brake wear emissions rates provided by EMFAC2021. Inputs to the emissions models (both EMFAC2021 and CT-EMFAC2017) include region (i.e., San Mateo County), type of road (i.e., Major/Collector), year of analysis (i.e., 2040), and season (i.e., annual).

To estimate TAC and $PM_{2.5}$ emissions over the 30-year exposure period used for calculating the increased cancer risks, the EMFAC2021 and CT-EMFAC2017 models were used to develop vehicle emission factors for the year 2040. Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by EMFAC2021 and CT-EMFAC2017. Year 2040 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated.

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the U.S. EPA AERMOD dispersion model, which is recommended by the BAAQMD for this type of analysis.[20] TAC and $PM_{2.5}$ emissions from the nearby roadways within about 1,000 feet of the SPU area were evaluated. Vehicle traffic emissions were modeled in AERMOD using a series of volume sources along a line (line volume sources), with line segments used to represent opposing travel lanes on each roadway. The modeling used a five-year data set (2013 - 2017) of hourly meteorological data from the Moffett Field Airport. Other inputs to the model included road geometry, hourly traffic emissions, and receptor locations and heights. Annual TAC and $PM_{2.5}$ concentrations from traffic on each roadway were calculated at receptor heights of 5 feet (1.5 meters), 15 feet (4.5 meters), and 25 feet (7.6 meters) to represent the breathing heights on the first, second, and third floors of the nearby existing residences.

Computed Risks and Hazards from Project Traffic

Table 7 shows the impacts from the increase in traffic on the main roadways in the area due to the Ravenswood SPU. The unmitigated maximum cancer risks, annual $PM_{2.5}$ concentration, and non-cancer hazard index (HI) from SPU area traffic would not exceed the BAAQMD single- or cumulative-source significance thresholds at existing sensitive receptor locations. Figure 5 shows the modeled roadway segments and sensitive receptor locations. *Attachment 4* to this report includes the emission calculations used for the traffic modeling and the health risk calculations. When considering potential construction and/or stationary source impacts from Ravenswood SPU

[20] BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012

area projects, risks could exceed the BAAQMD thresholds. Without specific project-level analyses and proper emission controls applied, these impacts are considered significant.

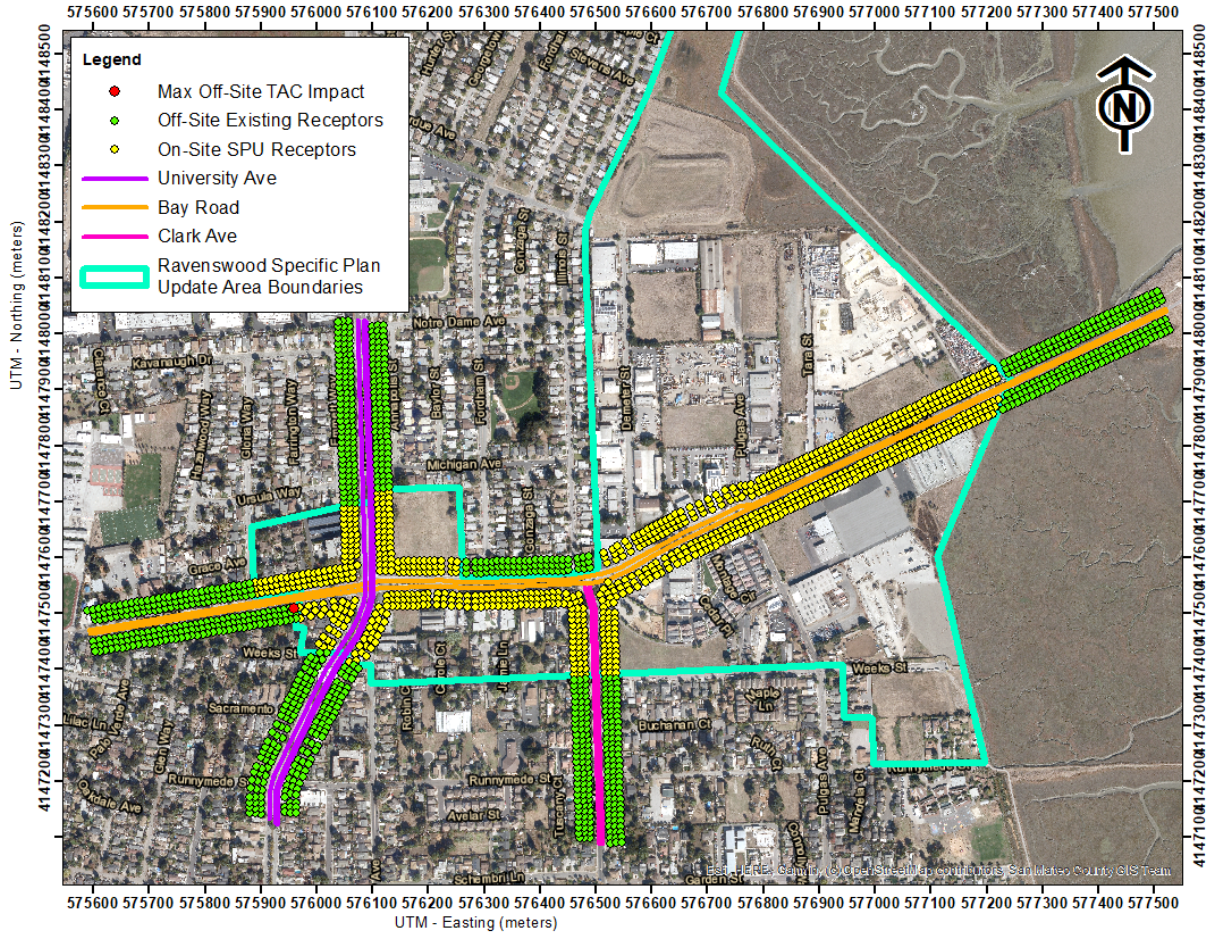
Table 13. Impacts from Plan Traffic Sources to Off-Site Receptors (Maximum Impact)

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
University Avenue - Project = 2,720 ADT	0.08	0.01	<0.01
Bay Road - Project = 7,755 ADT	1.34	0.14	<0.01
Clarke Avenue - Project = 2,509 ADT	<0.01	<0.01	<0.01
BAAQMD Single Source Threshold	***10.0***	***0.3***	***1.0***
Exceed Single Source Threshold?	*No*	*No*	*No*
University Avenue - Cumulative + Project = 29,024 ADT	0.85	0.11	<0.01
Bay Road - Cumulative + Project = 26,413 ADT	4.56	0.48	0.01
Clarke Avenue - Cumulative + Project = 13,767	0.03	0.03	<0.01
Combined Sources	5.44	0.61	<0.03
BAAQMD Cumulative Source Threshold	***100***	**0.8**	***10.0***
Exceed Cumulative Threshold?	*No*	*No*	*No*

Stationary Sources - Emergency Generators

Development of Ravenswood SPU would likely include stationary sources of TAC emissions such as backup power generators powered by diesel engines. These diesel engines would be subject to CARB's Stationary Diesel Airborne Toxics Control Measure (ATCM) and require permits from the BAAQMD, since they would be equipped with engines larger than 50-HP. BACT requirements would apply to these generators that would limit DPM emissions. As part of the BAAQMD permit requirements for toxics screening analysis, the engine emissions will have to meet Best Available Control Technology for Toxics (T-BACT) and pass the health risk screening level of less than ten in a million. The risk assessment would be prepared by BAAQMD. Depending on results, BAAQMD would set limits for DPM emissions (e.g., more restricted engine operation periods).

Figure 5. Locations of Modeled Project Roadway Sources and Sensitive Receptors



Risks and Hazards from the Construction and Operation of Individual Projects in the SPU Area

Build out of Ravenswood SPU would occur over many years. Construction emissions are expected to occur intermittently through the build out period while other projects are completed and become operational. While emissions in the SPU area are expected to increase due to the increase in activity, these will be somewhat be offset as construction equipment and on-road vehicles become more modern and are subject to new regulations that will decrease emissions over time. Future projects would have to consider the combination of construction and operational health risks from traffic and stationary sources as well as cumulative health risks that include impact from other projects also under construction.

Cumulative Health Risks to Off-Site Receptors

BAAQMD significance thresholds for health risk and hazards also address the combined influence from other nearby sources. The impacts from sources within 1,000 feet of the receptor most affected by the Plan impacts are considered. In this case, the only substantial sources of emissions are from traffic. While there are stationary sources in the Plan area, their influence at the receptor most affected by build out of Ravenswood SPU would be negligible. Table 13 shows that health

risks and hazards from combined cumulative plus project traffic conditions would results in risks below the applicable BAAQMD-recommended thresholds.

Ravenswood SPU AQ-6: Require Future Projects Located within 1,000 Feet of Sensitive Receptors to Perform a Health Risk Assessment.

Applicants proposing development of projects within 1,000 feet of existing sensitive receptors as defined by the BAAQMD (e.g., residential, schools) shall prepare a site-specific construction and operational health risk assessment (HRA). If the HRA demonstrates, to the satisfaction of the City, that the health risk exposures for adjacent receptors will be less than BAAQMD project-level thresholds, then additional mitigation would not be unnecessary. However, if the HRA demonstrates that health risks would exceed BAAQMD project level thresholds, additional feasible on- and off-site mitigation shall be identified to further reduce risks to the greatest extent practicable.

Measures to avoid significant construction health risks impacts that could be included in projects, depending on the results of the project-specific HRAs could include:[21]

1. Use Tier 4 engines for all off-road equipment greater than 25 horsepower (hp) and operating for more than 20 total hours over the entire duration of construction activities.

2. Use diesel trucks with 2010 or later compliant model year engines during construction.

3. Use renewable diesel during construction.

4. Use low-VOC coatings during construction.

5. Implement fugitive dust best management practices and if necessary, enhanced measures recommended by BAAQMD.

6. Use portable electrical equipment where commercially available and practicable to complete construction. Construction contractors shall utilize electrical grid power instead of diesel generators when (1) grid power is available at the construction site; (2) when construction of temporary power lines are not necessary in order to provide power to portions of the site distant from existing utility lines; (3) when use of portable extension lines is practicable given construction safety and operational limitations; and (4) when use of electrical grid power does not compromise construction schedules.

7. Phase construction appropriate to lower the intensity of emissions at any one location with sensitive receptors.

8. Provide enhanced air filtration for sensitive receptors adversely affected by project emissions.

[21] Note that many of these measures are required through implementation of mitigation measures AQ-2, AQ-3, AQ-4, and AQ-5.

Ravenswood SPU AQ-7: Periodically Review and Update Air Quality Mitigation Measures

The City shall review on a regular basis the Ravenswood SPU air quality mitigation measures to ensure that they incorporate the most current and feasible measures recommended by BAAQMD. Project construction and introduction of new land uses will occur over 10 to 20 years into the future where newer measures may be recommended and measures that were once considered not feasible are now available to reduce emissions.

Effectiveness of Ravenswood SPU AQ-2, AQ-3, AQ-4, AQ-5, AQ-6, and AQ-7

The implementation of these measures represents the best available methods to minimize emissions of air pollutants and TACs from the Ravenswood SPU. These measures are anticipated to reduce emissions of TACs and $PM_{2.5}$ from construction by at least 85 percent below those generated by uncontrolled projects. Operational emissions from each project would also be reduced, but the amount would be dependent on the project type of use and type of emissions sources (i.e., stationary sources vs. traffic). Proper implementation of these measures would reduce health risk impacts associated with the SPU to a level of *less-than-significant*.

Non-CEQA Health Risk Impacts

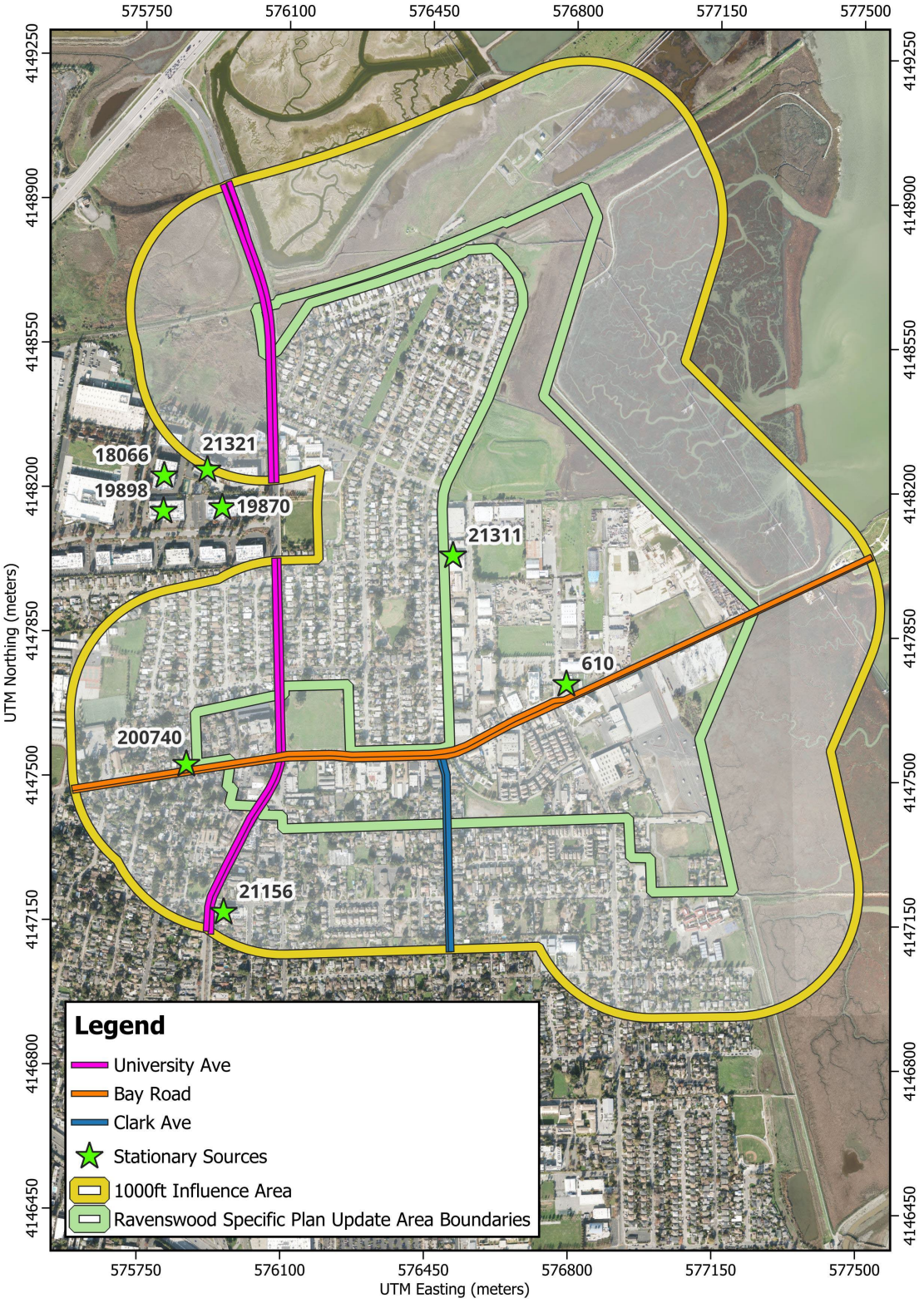
A screening risk assessment was completed to analyze the impact existing TAC sources would have on the new proposed sensitive receptors (i.e., residents) that the Ravenswood SPU would introduce. Details of the modeling and health risk calculations are included in *Attachment 5*. Furthermore, the BAAQMD CEQA Guidelines recommend identification of buffers for air pollutants and TACs for assessing plan impacts and the City's General Plan requires appropriate site planning when developing new sensitive land uses near sources of air pollutants.

<u>Existing Sources of TACs</u>

According to the BAAQMD CEQA Air Quality Guidelines, for a plan to have a less-than-significant impact with respect to TACs, overlay zones must be established around existing and proposed land uses that would emit TACs. Overlay zones to avoid TAC impacts must be reflected in local plan policies, land use maps, or implementing ordinances.

The Ravenswood SPU would permit and facilitate the development of land uses that may locate new sensitive receptors, such as new residences, in proximity to arterial and collector roadways, highways, and stationary sources of TAC emissions. A 1,000-foot buffer was drawn around the specific plan area to identify which TAC sources would affect sensitive receptors. Screening levels indicate that sensitive receptors within the Planning Area could be exposed to levels of TACs and or $PM_{2.5}$ that could cause an unacceptable health risk near high-volume roadways and stationary sources. Figure 6 shows the specific plan boundaries and all the TAC sources identified within the 1,000-foot buffer.

Figure 6. Ravenswood Specific Plan Update Boundaries, 1000-foot Buffer, and Nearby TAC Sources[22]



[22] The unique numbers associated with all the BAAQMD Permitted Stationary Sources are their assigned identification codes.

Local Roadways – University Avenue, Bay Road, and Clarke Avenue

Health risks from roadway traffic at future sensitive receptors within the Ravenswood SPU area were analyzed using the projected traffic volumes for each roadway within 1,000 feet of the surrounding Ravenswood SPU area assuming Plan buildout.[23] The following roadway ADTs were used:

- University Avenue: 29,024 vehicles
- Bay Road: 26,413 vehicles
- Clarke Avenue: 13,767 vehicles

Roadway emissions, dispersion modeling, and risk impacts were analyzed and calculated in the same manner as described previously for existing sensitive receptors. Table 14 lists information about the roadways and the buffer distances where exceedances may occur. Future traffic volumes are subject to change and each roadway would need to be re-evaluated on a project level basis.

Table 14. Roadway Segments and Buffer Distances for Exceedance of BAAQMD Thresholds (Measured from Edge of the Roadway)

Road	ADT	Road Direction	Side of Road	Buffer Distance for Exceedance (feet)
University Avenue	29,024	North-South Roadway	East	150
			West	50
Bay Road	26,413	East-West Roadway	North	No Exceedance
			South	50
Clarke Avenue	13,767	North-South Roadway	East	No Exceedance
			West	No Exceedance

Existing Stationary Sources

As shown in Figure 6, there are numerous permitted stationary sources located throughout the Ravenswood SPU area. The impact of these sources on new residents in the Plan area can only be addressed on a project-by-project basis since impacts are generally localized. When siting new sensitive receptors, the BAAQMD Guidelines advise lead agencies examine existing or future proposed sources of TAC and/or $PM_{2.5}$ emissions that would adversely affect individuals within the planned project. Without proper setbacks or mitigation measures, these sources could result in TAC levels that are considered significant for new sensitive receptors. To assist lead agencies, BAAQMD has developed a database of permitted sources within the air district, which can be found at BAAQMD's *Permitted Stationary Sources 2020* GIS website.[24] This online tool provides the screening levels of cancer risk, HI, and $PM_{2.5}$ concentrations. These screening risk values can be adjusted for distance using factors provided by BAAQMD.

[23] Hexagon Transportation Consultants, Inc., Ravenswood Specific Plan Update Transportation Analysis, March 7, 2023.
[24] BAAQMD, Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3

If a given stationary source has the potential for significant health risk impacts at a receptor location, the source can be further analyzed by contacting BAAQMD for additional information and a refined modeling analysis conducted. A refined analysis would include dispersion modeling of the source using emissions and source information provided by BAAQMD. If the source still has significant health risk impacts following the refined analysis, then risk reduction strategies would have to be implemented by the project, including but not limited to, mechanical air filtration systems.

BAAQMD does not guarantee the accuracy of their *Permitted Stationary Sources 2020* GIS website, as some sources shown outside of the area may actually be located within the area. Sources around the area were checked by cross referencing their address. However, it cannot be certain that all misplaced sources that belong in the area were identified. In addition, new sources are added or taken out of service. BAAQMD updates this database and numerous updates are likely as the Ravenswood Specific Plan is built out. Given these uncertainties, new sensitive land uses built within the plan area should perform their own, site-specific studies prior to finalizing any development plans. This process would involve submittal of a stationary source inquiry form (SSIF) to BAAQMD. This ensures that the most recent stationary sources are included and analyzed.

Hazardous Materials

This review only addresses sources that routinely emit TACs and air pollutants. There may be facilities that handle and store hazardous materials on site and potentially near sensitive receptors. However, the accidental release of these materials, liquids or gases could create hazardous conditions. Therefore, it is recommended that facilities handling hazardous materials should be identified and their potential hazards should be considered prior to developing any sensitive land uses in their proximity.

Existing Stationary Sources Requiring Special Focus

The Romic Environmental Technologies Hazardous Waste Management Facility is located along the eastern side of Tara Street. Special care should be taken to make sure this site requires the facilitation of hazardous materials remediation to the standards of the U.S. EPA, the California Department of Toxic Substances Control, and the San Francisco Bay Regional Water Quality Control Board. This site is not expected to be a source of odors.

Construction Projects Underway or Soon-to-Be Underway

The City of East Palo Alto has a mapping tool online that pinpoints where new development projects are within the entire city.[25] The map lists projects that are approved and under review. Within the Ravenswood Specific Plan area, there are six projects approved by the planning commission and five projects under review. The projects that have been approved include 1675, 1990, and 2020 Bay Road, 851 Weeks Street and East Palo Alto Waterfront projects. All these approved developments would change the current land uses. Therefore, it is advised that these

[25] City of East Palo Alto, *Projects*, Web: https://www.ci.east-palo-alto.ca.us/projects

projects be considered completed when considering the sensitive receptors proposed by the Ravenswood SPU. Note that the developments under review, including 1804 and 2081 Bay Road, 965 Weeks Street, 2555 Pulgas Avenue, JobTrain Office, and Boom Park projects, should not be considered complete until approved.

Recommended Condition of Approval: Conduct project-specific on-site health risk assessments for new developments that propose new sensitive receptors within the Ravenswood SPU area to identify appropriate measures to reduce TAC and air pollutant exposures. Such measures could include Project-specific site design and use of enhanced filtration in ventilation systems.

Impact 4: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Future construction activities in the Ravenswood SPU area could result in odorous emissions from diesel exhaust associated with construction equipment. Because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, exposure of sensitive receptors to these emissions would be limited. Therefore, odors from construction that could cause complaints from the general public and affect a substantial number of people are not expected.

BAAQMD has identified a variety of land uses and types of operations that produce emissions that may lead to odors in their CEQA Air Quality Guidelines. Various uses within Ravenswood SPU could be developed that create localized odors. An example would include restaurants or small water treatment facilities or other industrial uses could be developed that have localized odors. The Ravenswood FEIR addresses odor sources by requiring new restaurants located in mixed-use developments, or adjacent to residential developments install kitchen exhaust vents with filtration systems, re-route vents away from residential development, or use other accepted methods of odor control, in accordance with local building and fire codes.

GREENHOUSE GAS EMISSIONS

Setting

Greenhouse gases (GHGs) are chemical compounds that trap heat in the earth's atmosphere, raising its temperature. The most common GHGs are carbon dioxide (CO_2) and water vapor but there are also several others, most importantly methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO_2, CH_4, and N_2O are byproducts of fossil fuel combustion.
- N_2O is associated with agricultural operations such as fertilization of crops.
- CH_4 is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents but their production has been stopped by international treaty.
- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of CO_2 equivalents (CO_2e).

An expanding body of scientific research supports the theory that global climate change is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California are adversely affected by the global warming trend. Increased precipitation and sea level rise will increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes, and drought; and increased levels of air pollution.

Federal and State Regulatory Actions for GHG Emissions

Executive Order S-3-05 – California GHG Reduction Targets

Executive Order (EO) S-3-05 was signed by Governor Arnold Schwarzenegger in 2005 to set GHG emission reduction targets for California. The three targets established by this EO are as follows: (1) reduce California's GHG emissions to 2000 levels by 2010, (2) reduce California's GHG emissions to 1990 levels by 2020, and (3) reduce California's GHG emissions by 80 percent below 1990 levels by 2050.

Assembly Bill 32 – California Global Warming Solutions Act (2006)

Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, CEC, California Public Utilities Commission (CPUC), and Building Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05, which has a target of reducing GHG emissions 80 percent below 1990 levels.

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

As directed by AB 32, CARB has also approved a statewide GHG emissions limit. On December 6, 2007, CARB staff resolved an amount of 427 million metric tons (MMT) of CO_2e as the total statewide GHG 1990 emissions level and 2020 emissions limit. The limit is a cumulative statewide limit, not a sector- or facility-specific limit. CARB updated the future 2020 BAU annual emissions forecast, due to the economic downturn, to 545 MMT of CO_2e. Two GHG emissions reduction measures currently enacted that were not previously included in the 2008 Scoping Plan baseline inventory were included, further reducing the baseline inventory to 507 MMT of CO_2e. Thus, an estimated reduction of 80 MMT of CO_2e is necessary to reduce statewide emissions to meet the AB 32 target by 2020.

Executive Order B-30-15 & Senate Bill 32 GHG Reduction Targets – 2030 GHG Reduction Target

In April 2015, Governor Brown signed EO B-30-15, which extended the goals of AB 32, setting a greenhouse gas emissions target at 40 percent of 1990 levels by 2030. On September 8, 2016, Governor Brown signed Senate Bill (SB) 32, which legislatively established the GHG reduction target of 40 percent of 1990 levels by 2030. In November 2017, CARB issued *California's 2017 Climate Change Scoping Plan*. [26] While the State is on track to exceed the AB 32 scoping plan 2020 targets, this plan is an update to reflect the enacted SB 32 reduction target.

SB 32 was passed in 2016, which codified a 2030 GHG emissions reduction target of 40 percent below 1990 levels. CARB has released a proposed final 2022 Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The 2022 plan:

- Identifies a path to keep California on track to meet its SB 32 GHG reduction target of at

[26] California Air Resource Board, 2017. *California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Targets.* November. Web: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf

least 40 percent below 1990 emissions by 2030.
- Identifies a technologically feasible, cost-effective path to achieve carbon neutrality by 2045 or earlier.
- Focuses on strategies for reducing California's dependency on petroleum to provide consumers with clean energy options that address climate change, improve air quality, and support economic growth and clean sector jobs.
- Integrates equity and protecting California's most impacted communities as a driving principle.
- Incorporates the contribution of natural and working lands to the state's GHG emissions, as well as its role in achieving carbon neutrality.
- Relies on the most up to date science, including the need to deploy all viable tools, including carbon capture and sequestration as well a direct air capture.
- Evaluates multiple options for achieving our GHG and carbon neutrality targets, as well as the public health benefits and economic impacts associated with each.

The proposed final 2022 Scoping Plan was released by CARB on November 16, 2022 and once adopted, will lay out how the state can get to carbon neutrality by 2045 or earlier. It is also the first Scoping Plan that adds carbon neutrality as a science-based guide and touchstone beyond statutorily established emission reduction targets.[27]

The mid-term 2030 target is considered critical by CARB on the path to obtaining an even deeper GHG emissions target of 80 percent below 1990 levels by 2050, as directed in Executive Order S-3-05. The 2022 Scoping Plan outlines the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure, providing a blueprint to continue driving down GHG emissions and to not only obtain the statewide goals, but cost-effectively achieve carbon-neutrality by 2045 or earlier. In the 2022 Scoping Plan, CARB recommends:

- VMT per capita reduced 12% below 2019 levels by 2030 and 22% below 2019 levels by 2045.
- 100% of Light-duty vehicle sales are zero emissions vehicles (ZEV) by 2035.
- 100% of medium duty/heavy duty vehicle sales are ZEV by 2040.
- 100% of passenger and other locomotive sales are ZEV by 2030.
- 100% of line haul locomotive sales are ZEV by 2035.
- All electric appliances in new residential and commercial building beginning 2026 (residential) and 2029 (commercial).
- 80% of residential appliance sales are electric by 2030 and 100% of residential appliance sales are electric by 2035.
- 80% of commercial appliance sales are electric by 2030 and 100% of commercial appliance sales are electric by 2045.

Executive Order B-55-18 – Carbon Neutrality

In 2018, a new statewide goal was established to achieve carbon neutrality as soon as possible, but no later than 2045, and to maintain net negative emissions thereafter. CARB and other relevant

[27] https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

state agencies are tasked with establishing sequestration targets and create policies/programs that would meet this goal. The Draft 2022 Scoping Plan Update addresses EO B-55-18 and would cost-effectively achieve carbon-neutrality by 2045 or earlier.

Executive Order B-55-18 – Carbon Neutrality

In 2018, a new statewide goal was established to achieve carbon neutrality as soon as possible, but no later than 2045, and to maintain net negative emissions thereafter. CARB and other relevant state agencies are tasked with establishing sequestration targets and create policies/programs that would meet this goal.

Senate Bill 375 – California's Regional Transportation and Land Use Planning Efforts (2008)

California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 provides incentives for local governments and applicants to implement new conscientiously planned growth patterns. This includes incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The legislation also allows applicants to bypass certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with traffic congestion, would be encouraged. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB works with the metropolitan planning organizations (e.g., Association of Bay Area Governments [ABAG] and Metropolitan Transportation Commission [MTC]) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

Senate Bill 350 - Renewable Portfolio Standards

In September 2015, the California Legislature passed SB 350, which increases the states Renewables Portfolio Standard (RPS) for content of electrical generation from the 33 percent target for 2020 to a 50 percent renewables target by 2030.

Senate Bill 100 – Current Renewable Portfolio Standards

In September 2018, SB 100 was signed by Governor Brown to revise California's RPS program goals, furthering California's focus on using renewable energy and carbon-free power sources for its energy needs. The bill would require all California utilities to supply a specific percentage of their retail sales from renewable resources by certain target years. By December 31, 2024, 44 percent of the retails sales would need to be from renewable energy sources, by December 31, 2026 the target would be 40 percent, by December 31, 2017 the target would be 52 percent, and by December 31, 2030 the target would be 60 percent. By December 31, 2045, all California

utilities would be required to supply retail electricity that is 100 percent carbon-free and sourced from eligible renewable energy resource to all California end-use customers.

California Building Standards Code – Title 24 Part 11 & Part 6

The California Green Building Standards Code (CALGreen Code) is part of the California Building Standards Code under Title 24, Part 11.[28] The CALGreen Code encourages sustainable construction standards that involve planning/design, energy efficiency, water efficiency resource efficiency, and environmental quality. These green building standard codes consist of a set of mandatory standards required for new development, as well as two more voluntary standards known as Tier 1 and Tier 2 applicable to residential and non-residential developments. The most recent CALGreen Code (2019 California Building Standard Code) was effective as of January 1, 2020. However, the CALGreen Code is updated every three years. A revised Code (2022 California Building Standard Code) will be effective as of January 1, 2023.

The California Building Energy Efficiency Standards (California Energy Code) is under Title 24, Part 6 and is overseen by the California Energy Commission (CEC). This code includes design requirements to conserve energy in new residential and non-residential developments, while being cost effective for homeowners. This Energy Code is enforced and verified by cities during the planning and building permit process.

The current energy efficiency standards (2019 Energy Code) replaced the 2016 Energy Code as of January 1,2020. Under the 2019 standards, single-family homes are predicted to be 53 percent more efficient than homes built under the 2016 standard due more stringent energy-efficiency standards and mandatory installation of solar photovoltaic systems. For nonresidential developments, it is predicted that these buildings will use 30 percent less energy due to lightening upgrades.[29]

The 2022 CALGreen Code makes minor refinements to the 2019 Code, but there are a few notable additions including requirements that new construction be "all electric ready," include energy storage systems (ESS), further improve indoor air quality, and increased deployment of EV chargers in various building types, including multifamily residential and nonresidential land uses. This means new construction needs to include EV readiness, EV capable parking spaces, installation of EV chargers, and the installation of Level 2 EV supply equipment. Providing EV charging infrastructure that meets current (2019) CALGreen requirements will not be sufficient to power the anticipated more extensive level of EV penetration in the future that is needed to meet SB 30 climate goals.

CEC studies have identified the most aggressive electrification scenario as putting the building sector on track to reach the carbon neutrality goal by 2045.[30] Installing new natural gas infrastructure in new buildings will interfere with this goal. To meet the State's goal, communities

[28] See: https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen#:~:text=CALGreen%20is%20the%20first%2Din,to%201990%20levels%20by%202020.
[29] See: https://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Building_Standards_FAQ_ada.pdf
[30] California Energy Commission. 2021. F*inal Commission Report: California Building Decarbonization Assessment. Publication Number CEC-400-2021-006-CMF*.August

have been adopting "Reach" codes that prohibit natural gas connections in new and remodeled buildings.

SB 743 Transportation Impacts

Senate Bill 743 required lead agencies to abandon the old "level of service" metric for evaluating a project's transportation impacts, which was based solely on the amount of delay experienced by motor vehicles. In response, the Governor's Office of Planning and Research (OPR) developed a VMT metric that considered other factors such as reducing GHG emissions and developing multimodal transportation[31]. A VMT-per-capita metric was adopted into the CEQA Guidelines Section 15064.3 in November 2017. Given current baseline per-capita VMT levels computed by CARB in the 2030 Scoping Plan of 22.24 miles per day for light-duty vehicles and 24.61 miles per day for all vehicle types, the reductions needed to achieve the 2050 climate goal are 16.8 percent for light-duty vehicles and 14.3 percent for all vehicle types combined. *Based on this analysis (as well as other factors), OPR recommended using a 15-percent reduction in per capita VMT as an appropriate threshold of significance for evaluating transportation impacts.*

Advanced Clean Cars

The Advanced Clean Cars Program, originally adopted by CARB in 2012, was designed to bring together CARB's traditional passenger vehicle requirements to meet federal air quality standards and also support California's AB 32 goals to develop and implement programs to reduce GHG emissions back down to 1990 levels by 2020, a goal achieved in 2016 as a result of numerous emissions reduction programs[32].

This recent rule, *Advanced Clean Cars II (ACC II)* is phase two of the original rule. ACC II establishes a year-by-year process, starting in 2026, so all new cars and light trucks sold in California will be zero-emission vehicles by 2035, including plug-in hybrid electric vehicles. The regulation codifies the light-duty vehicle goals set out in Governor Newsom's Executive Order N-79-20. Currently, 16 percent of new light-duty vehicles sold in California are zero emissions or plug-in hybrids. By 2030, 68 percent of new vehicles sold in California would be zero emissions and 100 percent by 2035.

Federal and Statewide GHG Emissions

The U.S. EPA reported that in 2021, total gross nationwide GHG emissions were 6,340.2 million metric tons (MMT) carbon dioxide equivalent (CO_2e).[33] These emissions were lower than peak levels of 7,416 MMT that were emitted in 2007. CARB updates the statewide GHG emission inventory on an annual basis where the latest inventory includes 2000 through 2020 emissions.[34]

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[31] Governor's Office of Planning and Research. 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. December.

[32] CARB 2022. Advanced Clean Cars Program. See https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program accessed April 14, 2023

[33] United States Environmental Protection Agency, 2023. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2021*. April. Web: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

[34] CARB. 2022. *California Greenhouse Gas Emission for 2000 to 2020*. Web: https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/2000-2020_ghg_inventory_trends.pdf

In 2020, GHG emissions from statewide emitting activities were 369.2 MMT CO_2e. The 2020 emissions have decreased since peak levels in 2007 and are 35.3 MMT CO_2e lower than 2019 emissions level and 61.8 MMT CO_2e below the State's 2020 GHG limit of 431 MMT CO_2e. The 2019 to 2020 decrease in emissions is likely due in large part to the impacts of the COVID-19 pandemic. Economic recovery from the pandemic may result in emissions increases over the next few years. As such, the total 2020 reported emissions are likely an anomaly, and any near-term increases in annual emissions should be considered in the context of the pandemic.

City of East Palo Alto

Vista 2035 East Palo Alto General Plan

Land Use and Urban Design

Goal LU-1. Maintain an urban form and land use pattern that enhances the quality of life and meets the community's vision for its future.

Intent: To provide housing, employment, retail and services, recreation, arts, education and entertainment for the City's residents and businesses in an urban environment that promotes health, equity, prosperity, and well-being.

Policies:

1.1 Balanced land uses. Create a balanced land use pattern to support a jobs-housing balance, minimize traffic and vehicle miles traveled, reduce greenhouse gas emissions, and promote a broad range of housing choices, retail businesses, employment opportunities, cultural venues, educational institutions and other supportive land uses.

Health and Equity

Goal HE-10. Improve respiratory health through the City and strive to reduce incidence of asthma and other respiratory illnesses.

Intent: To use policies and regulations that reduce the impact of air pollution on residents in East Palo Alto.

Policies:

10.5 Clean technology. Attract "clean technology" companies to the Ravenswood Employment District, such as solar panel manufacturing and recycling companies that focus on innovative energy, water and waste technologies.

Parks, Open Space, and Conservation

Goal POC-7. Promote a sustainable energy system.

Intent: To enable citywide access to energy in a way that meets community needs while positioning the community for a sustainable energy future.

Policies:

7.1 Citywide building energy efficiency. Promote and encourage citywide building energy efficiency through strategies that may include the following:

- Retrofits of buildings with energy-efficient technology
- High energy performance in new buildings, in excess of CALgreen when possible.

7.2 Municipal building energy efficiency. Strive for high levels of energy efficiency in municipal facilities.

7.4 Renewable energy. Encourage the use of renewable energy in the City, including solar and wind in new and existing development.

Goal POC-8. Adapt to and mitigate climate change impacts.

Intent: To become a resilient community that is prepared for the health and safety impacts of and minimizes the risks of climate change.

Policies:

8.1 Climate Action Plan. Implement and regularly update the City's Climate Action Plan (CAP). Update the City's Greenhouse Gas Inventory and associated implementation actions matrix every 2 to 3 years, and the overall CAP framework document every 5 to 10 years.

8.2 Heat Island reduction. Require heat island reduction strategies in new developments such as light-colored cool roofs, light-colored paving, permeable paving, right-sized parking requirements, vegetative cover and planting, substantial tree canopy coverage, and south and west side tree planting.

8.4 Reducing GHG emissions. In consulting with applicants and designing new facilities, prioritize the selection of green building design features that enhance the reduction of greenhouse gas emissions.

8.5 Communications and outreach. Continue to work with the San Mateo County Public Health Department to establish social networks and website updates to distribute information on climate change impacts to vulnerable populations including actions they can take to reduce exposure to unhealthy condition.

8.6 Climate change and health. Acknowledge the ongoing and future impacts of climate change and extreme events on East Palo Alto's residents, taking action to minimize the effects among vulnerable populations and help implement California's executive order (EO) S-13-08 and the 2009 California Climate Adaption Strategy.

8.8 Efficiency incentives. Provide incentives for households to improve resource efficiency, such as rebate programs and giveaways for items such as low-flow shower heads and electrical outlet insulation.

8.9 Sustainable building code. Encourage changes in building code to reflect emphasis on health, sustainability, and energy efficiency. Look to the codes of other cities who are leaders.

8.10 Green building credentialing and incentives. Provide incentives for contractors to obtain Leadership in Energy & Environmental Design (LEED) professional credentials as well as LEED certification for their buildings.

8.11 Green building certification. Require that new residential, commercial, or mixed-use buildings over 20,000 square feet earn LEED Silver certification (or equivalent) including meeting the minimum CALGreen code requirements.

8.12 Green waste management practices. Support ongoing green waste recycling efforts and facilitate composting opportunities for residents and businesses in order to reduce surface ozone pollution and offset greenhouse gas emissions and provide soil nutrients.

East Palo Alto Climate Action Plan

The City of East Palo Alto Climate Action Plan[35] (CAP) is a plan to reduce GHG emissions and address climate change. The Climate Action Plan was adopted in December 2011. It contains goals and strategies to reduce greenhouse gas emissions by 15 percent below 2005 levels by 2020, in accordance with the AB 32 "Climate Change Scoping Plan". This CAP matured in 2020, with the implementation of 23 actions yielding approximately 20 percent GHG emissions reduction from 2005 levels. The demonstrated that its collective set of climate action policies as described in its CAP, along with its General Plan, ordinances, and other programs at the time was considered equivalent to a qualified GHG reduction strategy. However, the CAP is no longer consistent with the qualification goals and does not have a specific metric ton GHG threshold for project-level construction or operation. Therefore, the BAAQMD's CEQA Air Quality Guideline's thresholds are used.

Draft 2030 Climate Action Plan and Adaptation Strategies

[35] City of East Palo Alto, *Climate Action Plan*, February 2023. Web: https://www.cityofepa.org/econdev/page/climate-action-plan

The City is currently working on a Draft 2030 Community CAP and Adaptation Strategies that is under public review. The City's Draft 2030 CAP establishes guidelines for reaching the stated goal of reducing carbon emissions 50 percent below 2005 levels by 2030 and aspires to reach carbon neutrality by 2045, which would make it consistent with a qualified CAP once adopted.

BAAQMD GHG Significance Thresholds

The Notice of Preparation for the Ravenswood SPU was posted on April 15, 2022. At that time, the BAAQMD CEQA Air Quality Guidelines included quantified thresholds for GHG emissions for both plans and projects.

BAAQMD CEQA Guidelines

Under the 2017 CEQA Air Quality Guidelines, a local government may prepare a qualified GHG Reduction Strategy that is consistent with AB 32 goals. If a project is consistent with an adopted qualified GHG Reduction Strategy, it can be presumed that the project will not have significant GHG emissions under CEQA.[36] Alternatively, BAAQMD recommends a GHG threshold of 4.6 metric tons per capita for projects and 6.6 metric tons per capita for plans that consider all land uses (both ones that will be unchanged and new or modified land uses). These numeric thresholds were developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development of Ravenswood SPU occurs beyond 2020, so a threshold that addresses a future target is appropriate. The basis of the BAAQMD thresholds were used to develop plan level thresholds for 2040. Although BAAQMD did not publish a quantified threshold for 2030 or 2040, a threshold could be computed. Assuming the published thresholds are met (since the State did meet AB 32 goals before 2020), those thresholds could be reduced by 40 percent for 2030 and 80 percent by 2040. Table 15 provides those computed thresholds.

Unfortunately, the tools used to compute GHG emission are constrained to those emissions rates that are now occurring or regulated to occur in the future. The currently available models do not reflect the latest scoping plan strategies. For land use projects, these strategies include a phase out of combustion on-road vehicles, increased use of renewable fuels and electricity, and reduced demand for energy from fossil fuels. For example, the current roadway emissions are computed using EMFAC2021 that reflects emissions from types of vehicles and their emission rates projected to be on the road in 2040 using current regulations. Additional regulations are being adopted that will substantially lower future vehicle emissions, including the *ACC II,* described above, that requires 68 percent of new cars sold in California in 2030 to be zero emissions and 100 percent of vehicles sold by 2040.

2022 Adopted GHG Thresholds

On April 20, 2022, BAAQMD adopted new thresholds of significance for GHG emissions from land use projects for projects beginning the CEQA process. The following framework is how

[36] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May. See https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

BAAQMD will determine GHG significance moving forward.[37] Table 15 reports the threshold for plan-level analyses based on estimated GHG emissions, as well as per capita metrics, developed by BAAQMD.

The analysis presented below addresses both the Plan-Level and Project-Level thresholds recommended by BAAQMD in 2022. Project GHG emissions were computed and provided for informational purposes. Since buildout of the Ravenswood SPU would occur through 2040, achieving carbon neutrality would be the plan-level threshold applied.

[37] Justification Report: BAAQMD CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Project and Plans. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-thresholds-2022/justification-report-pdf.pdf?la=en

Table 15. BAAQMD Recommended Plan-Level and Project-Level GHG Significance Thresholds

Pollutant/Contaminant	Construction	Operational
GHGs contained in 2017 CEQA Air Quality Guidelines	None	Compliance with Qualified GHG Reduction Strategy OR 6.6 MT CO2e/SP/year (residents + employees) for Plans and 4.6 MT CO2e/SP/year for Projects. Note that 2040 emissions would be expected to be 80 percent lower than those in 2020 that are considered equivalent to 1990 levels.
GHGs adopted April 2022	None	A. Meet the State's goals to reduce emissions to 40 percent below 1990 levels by 2030 and carbon neutrality by 2045 OR B. Be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b). C. For Projects: 1. Buildings a. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development). b. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b)of the State CEQA Guidelines. 2. Transportation a. Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts. b. Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

GHG emissions associated with development of the proposed projects built within the Ravenswood SPU would occur over the short-term from construction activities, consisting primarily of emissions from equipment exhaust and worker and vendor trips. There would also be long-term emissions associated with vehicular traffic within the project vicinity, energy and water usage, and solid waste disposal. GHG emissions for the Ravenswood SPU buildout are discussed below and were analyzed using the methodology recommended in the BAAQMD CEQA Air Quality Guidelines.

CalEEMod Modeling

CalEEMod was used to predict GHG emissions assuming full build-out of the projects within the Ravenswood SPU. The project land use types and size and other project-specific information were input to the model, as described above within the operational period emissions. CalEEMod output is included in *Attachment 2*.

Buildout Emissions

The CalEEMod model along with the vehicle trip generation rates for the SPU were used to estimate daily emissions associated with the Plan. As shown in Table 16, the annual emissions resulting from operation of the proposed Ravenswood SPU scenarios are predicted to be 26,580, 63,690, 64,171, 72,267, and 72,693 MT of CO_2e when the various buildout scenarios are completed in 2040. In terms of per capita emissions, Ravenswood SPU would result in 3.48, 4.41, 4.45, 4.26, and 4.29 MT CO_{2e}/year/capita, which would decrease from 4.4 MT CO_{2e}/year/capita under existing conditions.

There are no quantified thresholds for GHG emissions adopted by the City or BAAQMD for evaluation of project level GHG emissions. BAAQMD in their latest adopted GHG thresholds recommend that the significance of plan level GHG emissions be evaluated based on consistency with an adopted GHG reduction plan or meet design elements that are critical in reducing GHG emissions. The City's CAP does not have a specific metric ton GHG threshold for plan level construction or operation. Therefore, the BAAQMD's CEQA Air Quality Guideline's thresholds are used.

Table 16. Annual Plan GHG Emissions (CO_2e) in Metric Tons and Per Capita

Source Category	Adopted 2013 Specific Plan (No Project) 2040	Proposed Ravenswood SPU Scenario #1 2040		Proposed Ravenswood SPU Scenario #2 2040	
	Loop	Loop	No Loop	Loop	No Loop
Area	10	17		20	
Energy Consumption	2,601	4,771		5,554	
Mobile[1]	22,485	56,427	56,908	63,844	64,270
Solid Waste Generation	1,219	1,862		2,125	
Water Usage	264	613		723	
Total (MT CO_{2e}/year)	26,580	63,690	64,171	72,267	72,693
Per Capita Emissions (MT CO_{2e}/year/capita)	3.48	4.41	4.45	4.26	4.29

[1] Does not include effects of *Advanced Clean Cars II* that will phase out the sale of emission vehicles by 2035.

Proposed projects built within the Ravenswood SPU would be constructed in conformance with CALGreen and the Title 24 Building Code, which requires high-efficiency water fixtures, water-efficient irrigation systems, and compliance with current energy efficacy standards. To avoid interference with statewide GHG reduction measures identified in CARB's Scoping Plan and SB 100 goals, any project built within the Ravenswood SPU will have to conform to the following measures:

1. Avoid construction of new natural gas connections,
    - **Does not conform** – new natural gas connections are being proposed as a part of this specific plan update.

2. Avoid wasteful or inefficient use of electricity,
    - Conforms – Any project built within the Ravenswood SPU will be required to meet CALGreen Mandatory Measures and LEED Gold Level Certification through the U.S. Green Building Council. Ravenswood SPU uses meeting these Standards and the City's code requirements would be considered to be energy efficient.

3. Include electric vehicle charging infrastructure that meets current Building Code CALGreen Tier 2 compliance, and
    - Conforms – projects developed within the plan area would be required to meet this threshold.

4. Reduce VMT per capita by 15 percent over baseline conditions.
    - Conforms – Residential and non-residential VMT per capita is predicted to be less than 15 percent below Year 2020 existing countywide VMT.[38] Due to size conditions, projects developed within the plan area would be required to implement the City's TDM requirements which would reduction average daily trip by 40%.

[38] Hexagon Transportation Consultants, Inc., Ravenswood Specific Plan Update Transportation Analysis, March 7, 2023.

Based on the latest citywide travel demand model, the residential VMT per capita would be 11.68 miles and the non-residential would be 16.38 miles. With a 40% reduction in daily trips per the City's TDM ordinance, the VMT per Ravenswood SPU resident would range from 7.04 to 6.69. VMT per Ravenswood SPU employee would range from 10.82 to 10.34 under both of the Ravenswood SPU buildout scenarios, resulting in a less-than-significant impact on VMT.

Plan Consistency

BAAQMD considerers a long-term communitywide plan (e.g., general plans, long-range development plans, climate action plans) to have a less-than-significant climate impact if it demonstrates that GHG emissions from the area will decline consistent with California's GHG reduction targets of 40 percent below 1990 levels by 2030 and carbon neutrality by 2045. The Ravenswood SPU is considered to fall under the category of long-range development plans. As shown in Table 16, Ravenswood SPU is predicted to increase emissions in the Plan area by up to 46,113 MT CO_2e/year through the addition of new residences and non-residential land uses. Therefore, the plan is in conflict with State goals and BAAQMD thresholds to achieve carbon neutrality by 2045.

The emissions forecast presented in Table 16 are based on current accepted modeling methods that include use of EMFAC2021 mobile emission factors, current solid waste generation rates and processing, and current emissions associated with water usage.

Mobile emissions are currently modeled to make up about 90 percent of Ravenswood SPU-generated emissions in 2040. The modeling of these emissions are based on the use of EMFAC2021 that does not include California's latest Advanced Clean Cars and Advanced Clean Trucks regulations. These regulations along with future reformulated fuel standards will reduce mobile emissions substantially. Additionally, new rules and regulations are likely to be adopted in the future, prior to 2040, that would reduce mobile emissions.

Energy use is the second highest source of GHG emissions, at about 8 percent of future emissions. These emissions were predicted based on default rates assigned by CalEEMod. GHG emissions associated with energy use are predicted based on the quantity of natural gas combusted per land use type. New measures to reduce or ban natural gas usage can greatly reduce these emissions.

Solid waste is the third highest source of GHG emissions, at about 4 percent of future emissions. These emissions were predicted based on current rates assigned by CalEEMod. GHG emissions associated with solid waste generation are predicted based on the transportation and processing of the waste stream. New measures to reduce solid waste, reducing emissions from hauling of solid waste and reuse of methane generated can greatly reduce these emissions.

Emissions associated with water usage make up about 2 percent of total Ravenswood SPU emissions. These emissions are likely to be reduced through greater water conservation efforts, use of recycled water available in the area for outdoor water usage, and the use of electricity generated from carbon-free sources.

Impact Finding

Based on current modeling, GHG emissions from Ravenswood SPU would be considered *significant*. This is based on the following findings:

1. Per capita GHG emissions are above any quantified threshold when considering future, year 2040, as a target year;

2. Ravenswood SPU cannot be demonstrated to have emissions that would meet the goal of carbon neutrality by 2045.

Proposed Specific Plan GHG Policy: Develop and Update Ravenswood SPU Policies to Reduce GHG Emissions.

Ravenswood SPU should develop policies that would support local and State efforts to reduce GHG emissions. Such policies would address the following:

- Future development projects shall comply with EV system requirements in the most recently adopted version of CALGreen Tier 2 requirements at the time a building permit application is filed.

- Develop solid waste minimization programs that include increased rates of recycling, composting of food, reuse of construction materials.

- Update Ravenswood SPU policies and implementing measures on a regular basis to measure progress and incorporate new measures to progress toward achieving carbon neutrality. Future updates to the Ravenswood SPU would respond to new local and State plans (e.g., State's upcoming scoping plan) to achieve GHG as well as new methods to more accurately model GHG emissions and implement innovative measures or project designs.

When the City adopts its revised 2030 CAP and Adaptation Strategies, it would have a qualified CAP, allowing streamlined development processing for projects in the SPU area, while conforming with GHG reduction goals.

Supporting Documentation

Attachment 1 is the methodology used to compute community risk impacts, including the methods to compute increased cancer risk from exposure to project emissions.

Attachment 2 includes the CalEEMod output for project construction and operational criteria air pollutants. Also included are any modeling assumptions.

Attachment 3 includes the EMFAC2021 emissions modeling.

Attachment 4 is the health risk assessment. This includes the summary of the dispersion modeling and the cancer risk calculations for SPU traffic increase . The AERMOD dispersion modeling files for this assessment, which are quite voluminous, are available upon request and would be provided in digital format.

Attachment 5 includes the health risk calculations, modeling results, and screening impacts from sources affecting the proposed future SPU receptors.

Attachment 1: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[39] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[40] This HRA used the 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.[41] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

Cancer Risk

Potential increased cancer risk from inhalation of TACs is calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency and duration of exposure. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day) or liters per kilogram of body weight per 8-hour period for the case of worker or school child exposures. As recommended by the BAAQMD for residential exposures, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. For children at schools and daycare facilities, BAAQMD recommends using the 95th percentile 8-hour breathing rates. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways). For workers, assumed to be adults,

[39] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.
[40] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[41] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

a 25-year exposure period is recommended by the BAAQMD. For school children a 9-year exposure period is recommended by the BAAQMD.

Under previous OEHHA and BAAQMD HRA guidance, residential receptors are assumed to be at their home 24 hours a day, or 100 percent of the time. In the 2015 Risk Assessment Guidance, OEHHA includes adjustments to exposure duration to account for the fraction of time at home (FAH), which can be less than 100 percent of the time, based on updated population and activity statistics. The FAH factors are age-specific and are: 0.85 for third trimester of pregnancy to less than 2 years old, 0.72 for ages 2 to less than 16 years, and 0.73 for ages 16 to 70 years. Use of the FAH factors is allowed by the BAAQMD if there are no schools in the project vicinity have a cancer risk of one in a million or greater assuming 100 percent exposure (FAH = 1.0).

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^6$

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air} \times DBR^* \times A \times (EF/365) \times 10^{-6}$

Where:

C_{air} = concentration in air $(\mu g/m^3)$
DBR = daily breathing rate (L/kg body weight-day)
8HrBR = 8-hour breathing rate (L/kg body weight-8 hours)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

* An 8-hour breathing rate (8HrBR) is used for worker and school child exposures.

The health risk parameters used in this evaluation are summarized as follows:

Exposure Type → / ***Age Range →*** / **Parameter**	**Infant** **3rd Trimester**	**0<2**	**Child** **2 < 16**	**Adult** **16 - 30**
DPM CPF $(mg/kg\text{-}day)^{-1}$	1.10E+00	1.10E+00	1.10E+00	1.10E+00
Vehicle TOG Exhaust CPF $(mg/kg\text{-}day)^{-1}$	6.28E-03	6.28E-03	6.28E-03	6.28E-03
Vehicle TOG Evaporative CPF $(mg/kg\text{-}day)^{-1}$	3.70E-04	3.70E-04	3.70E-04	3.70E-04
Daily Breathing Rate (L/kg-day) 95th Percentile Rate	361	1,090	745	335
8-hour Breathing Rate (L/kg-8 hours) 95th Percentile Rate	-	1,200	520	240
Inhalation Absorption Factor	1	1	1	1
Averaging Time (years)	70	70	70	70
Exposure Duration (years)	0.25	2	14	14*
Exposure Frequency (days/year)	350	350	350	350*
Age Sensitivity Factor	10	10	3	1
Fraction of Time at Home (FAH)	0.85-1.0	0.85-1.0	0.72-1.0	0.73*
* An 8-hour breathing rate (8HrBR) is used for worker and school child exposures.				

Non-Cancer Hazards

Non-cancer health risk is usually determined by comparing the predicted level of exposure to a chemical to the level of exposure that is not expected to cause any adverse effects (reference exposure level), even to the most susceptible people. Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

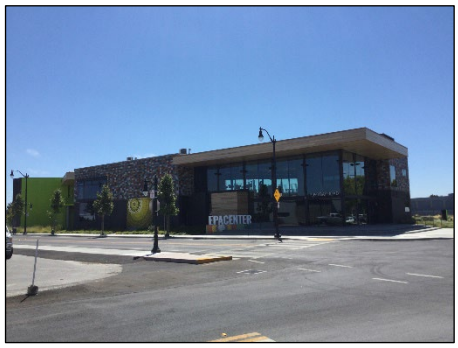
Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter ($\mu g/m^3$).

Annual $PM_{2.5}$ Concentrations

While not a TAC, fine particulate matter ($PM_{2.5}$) has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA). The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

Attachment 4: Project Operation Health Risk Calculations

Attachment 5: Cumulative Risk Information and Calculations



H. T. HARVEY & ASSOCIATES

Ecological Consultants

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Ravenswood Business District/4 Corners Transit-Oriented Development Specific Plan Update Biological Resources Report

Project #4656-01

Prepared for:

Amber Sharpe
David J. Powers & Associates, Inc.
1871 The Alameda, Suite 200
San José, CA 95126

Prepared by:

H. T. Harvey & Associates

October 15, 2024

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List of Preparers

Steve Rottenborn, Ph.D., Principal/Senior Wildlife Ecologist

Kelly Hardwicke, Ph.D., Senior Plant Ecologist

Stephen Peterson, M.S., Project Manager/Senior Wildlife Ecologist

Jane Lien, B.S., Wildlife Ecologist

Section 1. Introduction

The City of East Palo Alto's Ravenswood Business District /4 Corners Transit-Oriented Development (TOD) Specific Plan, approved in 2013, serves as a guide for development and redevelopment in the Specific Plan area and provides a policy and regulatory framework by which development projects and public improvements are reviewed. The City is proposing an update to the Specific Plan to increase the total amount of development allowed within the Specific Plan area by increasing the maximum square footages for office, research and development/life science, light industrial, civic/community, tenant amenity, and the total number of residential units allowed to be developed within the Specific Plan area.

H. T. Harvey & Associates has prepared this biological resources report to facilitate an update to the Biological Resources chapter of the 2012 Specific Plan Environmental Impact Report (2012 EIR) (Planning Center DC&E 2012). This report describes the existing biological resources present in the approximately 207-acre (ac) Specific Plan area located in the northeastern area of East Palo Alto, California in San Mateo County (Figure 1).

Included in this report are: 1) an updated description of the Specific Plan area's existing biological conditions and resources (including existing habitats, any potentially jurisdictional or sensitive habitats, and any other biological resources that might be of concern); 2) an updated discussion of the potential for occurrence of special-status plants and animals within the Specific Plan area and surrounding vicinity; 3) a description of the regulatory setting (laws or ordinances that might apply to the effects of Specific Plan activities on biological resources); 4) a description of potential impacts, including our opinions regarding whether those impacts should be considered significant under the California Environmental Quality Act (CEQA); and 5) a description of any mitigation measures that would be necessary to reduce impacts to less-than-significant levels under CEQA.

1.1 Project Description

The approximately 207-ac Specific Plan area is located in the northeastern portion of East Palo Alto, California. The Plan area is generally bounded by the City limits/Union Pacific Railroad (UPRR) tracks to the north, the western edge of the UPRR easement along the back of Illinois Street to the west, Weeks Street and Runnymede Street to the south, and the Ravenswood Open Space Preserve (OSP) and Palo Alto Baylands Nature Preserve to the east (Figure 2). Existing development within the Specific Plan area includes single-family and multi-family residential, retail, medical office, light and general industrial, and civic/institutional land uses. The Specific Plan area includes approximately 35 ac of park, trails, and open space area and 16 ac of restored wetland areas at the Ravenswood OSP.

Figure 1. Vicinity Map

Figure 2. Specific Plan Area Map

University Village, a single-family neighborhood located immediately east of University Avenue, and Cooley Landing, which is located immediately to the east at the end of Bay Road, were formerly located within the Specific Plan area; however, they are not a part of the updated Specific Plan (the updated Specific Plan area is therefore a smaller subset of the original 2013 Ravenswood Specific Plan area which was 350 ac in size). No land use changes are proposed for the University Village neighborhood. However, a new roadway (i.e., the Loop Road), which would extend northward from the current terminus of Demeter Street to connect with University Avenue, has been proposed in the updated Specific Plan. This new roadway would turn to the west and connect with University Avenue near the East Palo Alto City limits. The Loop Road is intended to provide a direct route between the Plan Area and University Avenue. It is expected to cause some of the existing traffic at the University/Bay intersection to instead use the Loop Road, thereby reducing the traffic at several study intersections on Bay Road and University Avenue. A shared bike/pedestrian path would be provided adjacent to the Loop Road, providing easy walking access to University Avenue and the trails along the bayfront, which would provide Ravenswood area residents and employees with opportunities for recreation. There are two configurations of the Loop Road under consideration: one with minimal or no vehicle lanes, and one with an expanded two-lane "Loop Road" inserted. However, while the Loop Road has transportation benefits, the feasibility of the Loop Road is uncertain at this time due to potential environmental constraints (which are described in this report) and requires further engineering and environmental analysis.

The City adopted the existing Ravenswood Specific Plan in 2013 (2013 Specific Plan). This plan provides a policy and regulatory framework for reviewing development projects and public improvements in the Specific Plan area. The 2013 Specific Plan allows for development of up to 1,127,850 square feet (ft) of office uses, 351,820 square ft of industrial or research and development (R&D) uses, 112,400 square ft of retail uses, 61,000 square ft of civic/community uses, and 835 housing units (comprised of 816 multifamily and 19 single-family units). The proposed Specific Plan update would increase the total amount of development allowed within the Specific Plan area by increasing the maximum square footages for office, R&D/life science, light industrial, civic/community, and tenant amenity, and the total number of residential units allowed under the Specific Plan.

The updated Specific Plan Environmental Impact Report (SEIR) would evaluate two development scenarios:

- Scenario #1 would consist of 2.8 million square ft of office and R&D, 250,000 square feet of industrial space, 43,870 square feet of tenant amenity space, and 1,350 residential units.

- Scenario #2 would consist of 3.3 million square ft of office and R&D, 300,000 square feet of industrial space, 53,500 square feet of tenant amenity space, and 1,600 residential units.

Compared to the 2013 Specific Plan, the proposed Specific Plan update would result in increasing the allowable intensity and height for proposed land uses. Under both buildout scenarios, all proposed increases in non-residential development square footage would occur on parcels within the Specific Plan area that currently allow such non-residential land uses. In contrast, the proposed Specific Plan update would allow for residential uses in more zones/parcels than what is allowed under the 2013 Specific Plan.

The proposed Specific Plan update also includes amendments to the East Palo Alto General Plan and Zoning Ordinance, which would amend existing land use designations in the Specific Plan area and update existing or establish new development standards to replace current zoning provisions applicable to the Specific Plan area.

Buildout of the Specific Plan update is projected to result in 4,190 residents and 9,645 jobs for Buildout Scenario 1, and 5,015 residents and 11,340 jobs for Buildout Scenario 2. In comparison, the 2013 Specific Plan was expected to generate an additional 2,450 residents and 5,110 jobs.

Maximum Building Heights

The Specific Plan update includes maximum building heights allowed for future developments in the Plan area. The maximum building heights range from approximately 30 ft to 122 ft above the ground surface.

Open Space Areas

The Specific Plan defines open space as publicly accessible open spaces, parks, and natural areas which serve the community by providing public access. Specific Plan update adds 31 ac of public parks and recreational facilities/amenities. The additional 31 ac of parks and recreational facilities would be improvements to existing facilities. The existing 16 ac of preserved/restored wetlands would remain in the Specific Plan area.

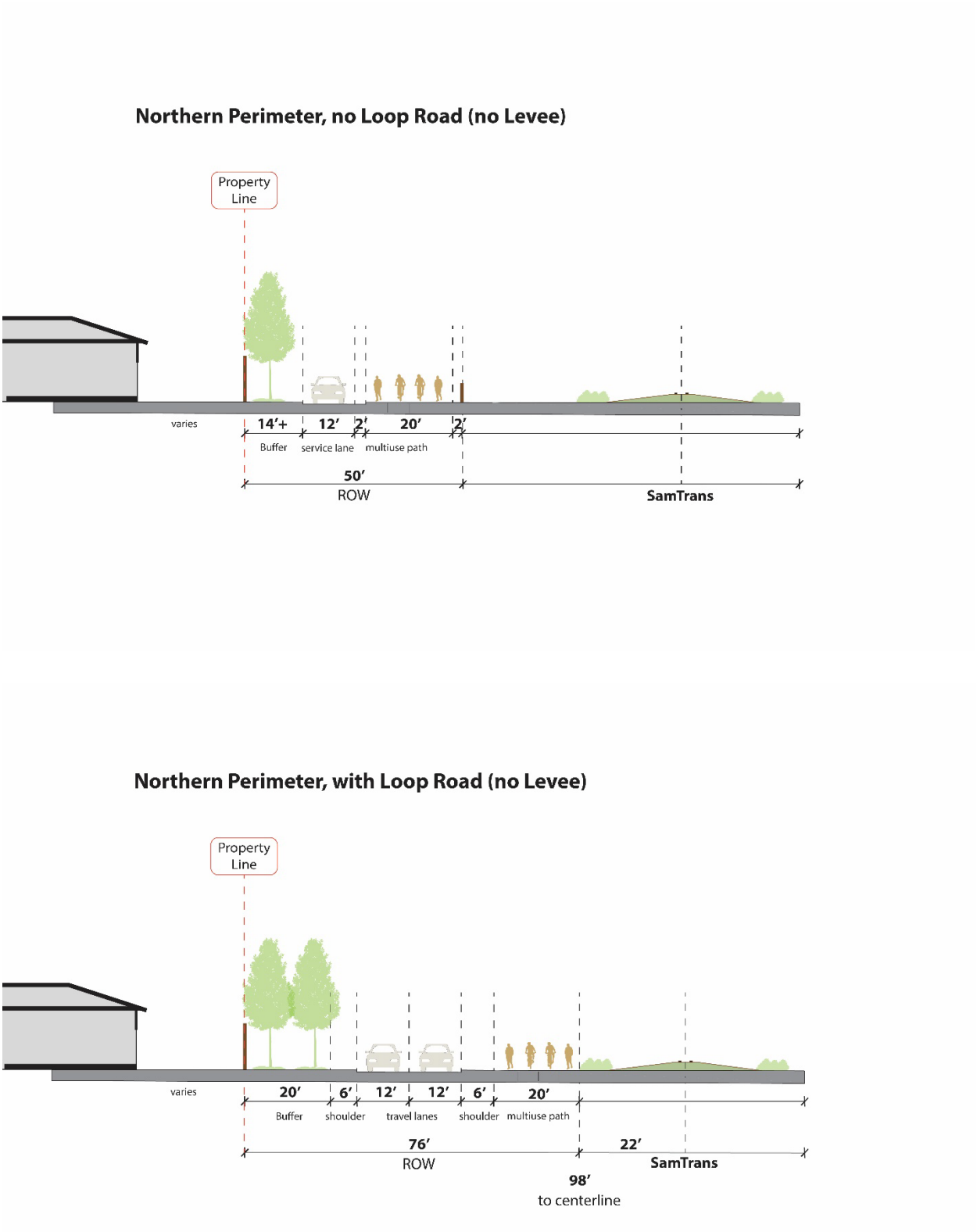
Street Network and Loop Road

The proposed street network for the Specific Plan area would consist of existing streets (public and private) and new streets for vehicles and/or people who would walk or bike in the Specific Plan area. For both project scenarios, a Loop Road (as described above), would be located along the perimeter of the northern portion of University Village (immediately to the west of the Specific Plan area) and extend from the existing terminus of Demeter Street to connect with University Avenue. The new loop road would turn to the west and connect with University Avenue near the East Palo Alto City limits. The Loop Road is intended to provide a direct route between the Specific Plan Area and University Avenue. Detailed plans of the future loop road are not available at this time; therefore, the updated SEIR will evaluate the Loop Road at a program-level. Supplemental environmental review will be required at the time detailed plans are available. Nonetheless, this report provides a preliminary analysis on potential environmental impacts from the construction of the Loop Road. Preliminary illustrated configurations of the Loop Road are shown below in Figure 3.

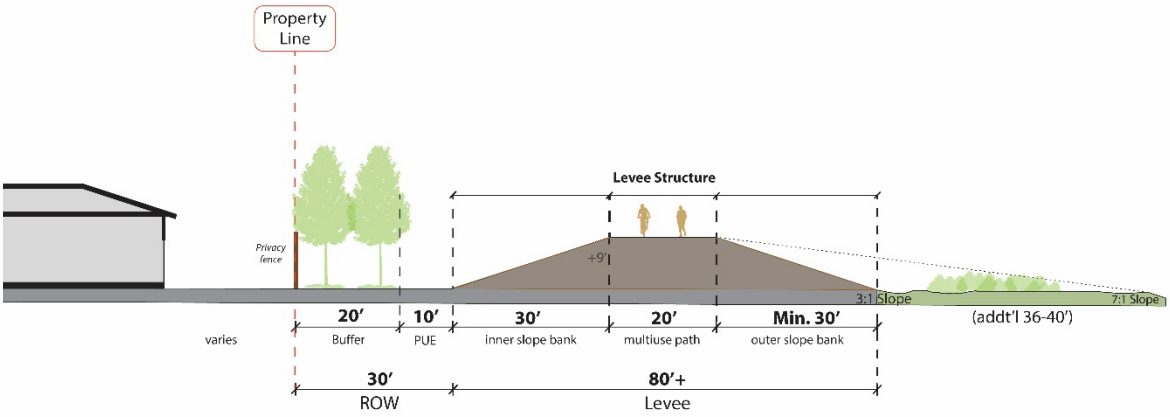
Future Levee

A future flood control levee may be constructed along the eastern edge of the Specific Plan area, adjacent to the Ravenswood OSP. The future levee would be constructed by San Francisquito Creek Joint Powers Authority (SFCJPA). Detailed plans are not available for the future levee at this time, and this report does not address potential environmental impacts from its construction. Rather, a separate environmental review process will be completed by SFCJPA to evaluate the environmental impacts of the future levee.

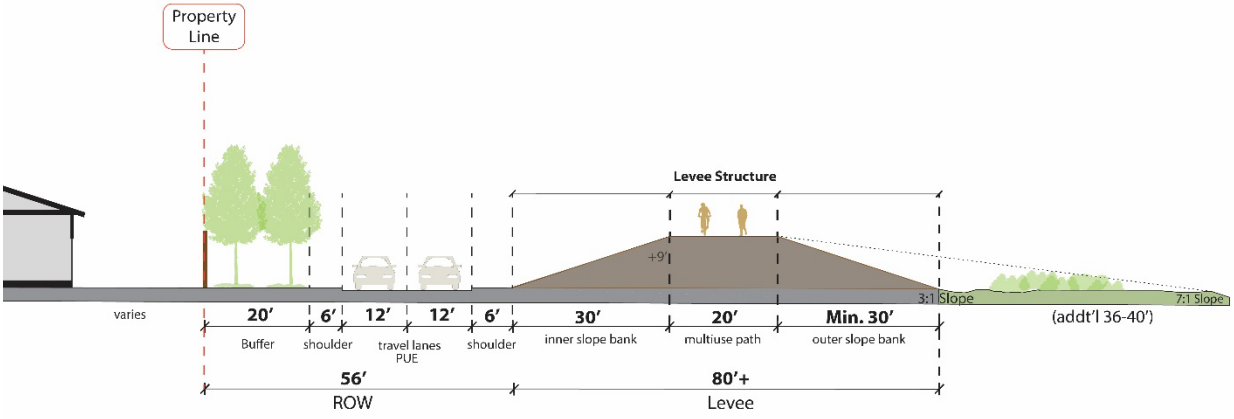
Figure 3. Preliminary Configurations of the Proposed Loop Road



Eastern Perimeter, no Loop Road, with Levee



Eastern Perimeter, with Loop Road and Levee



Section 2. Methods

2.1 Background Review

Prior to conducting field work, H. T. Harvey & Associates ecologists reviewed the 2012 EIR, the Notice of Preparation of an SEIR provided by David J. Powers & Associates on May 10, 2022, and a joint scoping letter addressed to the City of East Palo Alto from the Loma Prieta Chapter of the Sierra Club, the Citizens Committee to Complete the Refuge, Green Foothills, and Sequoia Audubon Society (May 16, 2022). In addition, maps and images of the Specific Plan area were obtained from the National Wetlands Inventory (2022), Natural Resources Conservation Service (NRCS) soil survey for the Specific Plan area (2022), historical aerial photographs provided by UC Santa Barbara (UCSB 2022), and current and historical aerials available on Google Earth Pro software (Google LLC 2022). The California Natural Diversity Database (CNDDB 2022) was also queried for special-status plants, animals, and natural communities of special concern that occur within a 5-mile (mi) radius surrounding the Specific Plan area. We also perused records of birds reported in nearby areas on eBird (Cornell Lab of Ornithology 2022).

In addition, for plants, we reviewed all species on current California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3 and 4 lists occurring in the project region, which is defined as the *Palo Alto* and the *Mountain View, California* USGS 7.5-minute quadrangles and surrounding ten quadrangles (*San Mateo, Redwood Point, Newark, Niles, Woodside, Milpitas, La Honda, Mindego Hill, Cupertino, San Jose West*).

Further, we reviewed both configurations of the proposed Loop Road under consideration, as shown in the preliminary Loop Road configuration illustrations as (Figure 3), as provided by David J. Powers & Associates on October 9, 2023.

2.2 Site Visit

A reconnaissance-level field survey of the Specific Plan area was conducted by H. T. Harvey & Associates senior wildlife ecologist Stephen L. Peterson, M.S. on July 20, 2022. The purpose of this survey was to: 1) assess existing biotic habitats and general wildlife communities within the Specific Plan area and in adjacent areas; 2) determine if existing biotic habitats and conditions are the same or different than what the 2012 EIR described; 3) assess the potential for future projects to impact special-status species and/or their habitats; and 4) identify potential jurisdictional habitats, such as waters of the U.S./State. Because of the proximity of the Specific Plan area to sensitive/regulated habitats, including habitats potentially supporting several special-status species, adjacent areas were scrutinized as well. In addition, H. T. Harvey & Associates has performed environmental review and planning assistance for a number of projects in the Specific Plan area and drew on this experience when preparing this biological resources report.

Finalization of habitat types present in the Specific Plan area utilized a combination of previously mapped habitats as described in the 2012 EIR, field survey verification, and the latest aerial imagery of the Specific Plan area (Google LLC 2022).

Section 3. Regulatory Setting

In this section we provide an updated list of federal, state, and local laws and ordinances that regulate biological resources found in the Specific Plan area, which are described below. Where our opinions differ substantively from those provided in the 2012 EIR, we have noted those differences.

3.1 Federal Regulations

3.1.1 Clean Water Act

The Clean Water Act (CWA) functions to maintain and restore the physical, chemical, and biological integrity of waters of the U.S., which include, but are not limited to, tributaries to traditionally navigable waters currently or historically used for interstate or foreign commerce, and adjacent wetlands. Historically, in non-tidal waters, U.S. Army Corps of Engineers (USACE) jurisdiction extends to the ordinary high water mark, which is defined in Title 33, CFR, Part 328.3. If there are wetlands adjacent to channelized features, the limits of USACE jurisdiction extend beyond the ordinary high water mark to the outer edges of the wetlands. Wetlands that are not adjacent to waters of the U.S. are termed "isolated wetlands" and, depending on the circumstances, may be subject to USACE jurisdiction. In tidal waters, USACE jurisdiction extends to the landward extent of vegetation associated with salt or brackish water or the high tide line. The high tide line is defined in 33 CFR Part 328.3 as "the line of intersection of the land with the water's surface at the maximum height reached by a rising tide." If there are wetlands adjacent to channelized features, the limits of USACE jurisdiction extend beyond the ordinary high water mark or high tide line to the outer edges of the wetlands.

On December 30, 2022, the U.S. Environmental Protection Agency and Department of the Army (the agencies) announced a final "Revised Definition of 'Waters of the United States'" rule founded upon the pre-2015 definition of "waters of the United States." This rule was formally adopted in January 2023. To determine jurisdiction for tributaries, adjacent wetlands, and additional waters, the January 2023 rule relies on the longstanding approach of applying two standards. Certain types of waters are jurisdictional under the final rule if they meet either the relatively permanent standard or significant nexus standard. Following adoption of the new revised definition, the May 25, 2023 Supreme Court decision in *Sackett v. Environmental Protection Agency* further affected what can be claimed as waters of the U.S. Rule changes to the January 2023 revised rule consistent with this decision were formally adopted in September 2023, and restrict which wetlands can be considered "adjacent" to relatively permanent features that connect to traditional navigable waters. Broadly, wetlands outside of relatively permanent waters connecting to other waters of the U.S. must be connected via a "continuous surface connection" to those relatively permanent waters to be considered adjacent and therefore waters of the U.S. regulated under the Clean Water Act.

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must comply with permit requirements of the USACE. No USACE permit will be effective in the absence of Section 401 Water Quality Certification. The State Water Resources Control Board (SWRCB) is the

state agency (together with the Regional Water Quality Control Boards [RWQCBs]) charged with implementing water quality certification in California.

Project Applicability: The USACE is likely to claim jurisdiction over the salt marsh, open water, and tidal slough habitats that occur along the eastern and northern edges of the Specific Plan area (Figure 4), adjacent to San Francisco Bay, and therefore the Specific Plan area contains waters of the United States. USACE Section 404 jurisdiction would include the salt marsh habitat up to the landward extent of the marsh vegetation or the high tide line, whichever is further. If the salt marsh, open water, or tidal slough habitats are impacted by future Specific Plan activities, such as the construction of the proposed Loop Road (which would encroach upon existing salt marsh habitat and a pond in the northeastern portion of the Ravenswood OSP), a Section 404 permit from the USACE for each project that impacts jurisdictional areas would be necessary.

3.1.2 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 prohibits the creation of any obstruction to the navigable capacity of waters of the U.S., including discharge of fill and the building of any wharfs, piers, jetties, and other structures without Congressional approval or authorization by the Chief of Engineers and Secretary of the Army (33 U.S.C. 403).

Navigable waters of the U.S., which are defined in 33 CFR, Part 329.4, include all waters subject to the ebb and flow of the tide, and/or those that are presently or have historically been used to transport commerce. The shoreward jurisdictional limit of tidal waters is further defined in 33 CFR, Part 329.12 as "the line on the shore reached by the plane of the mean (average) high water." It is important to understand that the U.S. Army Corps of Engineers (USACE) does not regulate wetlands under Section 10, only the aquatic or open waters component of bay habitat, and that there is overlap between Section 10 jurisdiction and Section 404 jurisdiction. According to 33 CFR, Part 329.9, a waterbody that was once navigable in its natural or improved state retains its character as "navigable in law" even though it is not presently used for commerce because of changed conditions and/or the presence of obstructions. Historical Section 10 waters may occur behind levees in areas that are not currently exposed to tidal or muted-tidal influence and meet the following criteria: (1) the area is presently at or below the mean high water (MHW) line; (2) the area was historically at or below mean high water in its "unobstructed, natural state"; and (3) there is no evidence that the area was ever above mean high water.

If a project also proposes to discharge dredged or fill material and/or introduce other potential obstructions in navigable waters of the U.S., a Letter of Permission authorizing these impacts must be obtained from the USACE under Section 10 of the Rivers and Harbors Act.

Project Applicability: The tidal salt marsh, open water, and tidal slough habitats that are considered waters of the U.S. and are subject to USACE jurisdiction as described in Section 3.1.1 above would also be considered current Section 10 waters. If impacts to Section 10 waters occur as a result of future Specific Plan activities, a Letter of Permission from the USACE will likely be required for each project that impacts jurisdictional areas.

Figure 4. Biotic Habitats Map

3.1.3 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) protects federally listed wildlife species from harm or take, which is broadly defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct." Take can also include habitat modification or degradation that directly results in death or injury of a listed wildlife species. An activity can be defined as take even if it is unintentional or accidental. Listed plant species are provided less protection than listed wildlife species. Listed plant species are legally protected from take under the FESA only if they occur on federal lands.

The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) have jurisdiction over federally listed, threatened, and endangered species under FESA. The USFWS also maintains lists of proposed and candidate species. Species on these lists are not legally protected under FESA, but may become listed in the near future and are often included in their review of a project.

Project Applicability: The 2012 EIR determined that one federally listed plant, California seablite (*Suaeda californica*), had low potential to occur in the Specific Plan area. Due to the near-extirpation of this species from the region except for a few well-known populations, as well as the absence of high-quality habitat from the Specific Plan area, it is our opinion that California seablite is absent from the Specific Plan area, and therefore, no federally listed plant species occur on or near the area.

However, several federally listed, proposed, or candidate animal species could occur in or adjacent to the Specific Plan area. The federally endangered California Ridgway's rail (*Rallus obsoletus obsoletus*) and salt marsh harvest mouse (*Reithrodontomys raviventris*) are known to occur in the Ravenswood OSP and other marshes located immediately east of the Specific Plan area, and both species likely occur in suitable salt marsh habitat along the eastern edge of the Specific Plan area. Additionally, the federally threatened western snowy plover (*Charadrius alexandrines nivosus*) occurs in managed ponds immediately north of the Specific Plan area.

The federally threatened Central California Coast steelhead (*Oncorhynchus mykiss*) and southern green sturgeon (*Acipenser medirostris*), and the federally proposed longfin smelt (*Spirinchus thaleichthys*), could enter the unnamed tidal slough located immediately east of the Specific Plan area during high tide; however, they likely do so very infrequently, if at all, due to the absence of high-quality habitat, the narrow and shallow nature of the slough, and the absence of suitable habitat upstream from the Specific Plan area. The Bay Road tidal slough is located within designated critical habitat for the steelhead and green sturgeon. The monarch butterfly (*Danaus plexippus*), a candidate for federal listing, may breed in small numbers in the Specific Plan area but occurs primarily as an uncommon migrant.

Specific Plan activities, including the construction of the proposed new loop road, which would encroach upon existing salt marsh habitat and an open pond in the Ravenswood OSP, could potentially result in take of federally listed or candidate species. During Section 404/Section 10 permitting, documentation of potential effects (or lack thereof) of projects on listed species will be prepared, and the USACE will consult as necessary with the USFWS and NMFS regarding any such effects.

3.1.4 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act governs all fishery management activities that occur in federal waters within the United States' 200-nautical-mi limit. The Act establishes eight Regional Fishery Management Councils responsible for the preparation of fishery management plans (FMPs) to achieve the optimum yield from U.S. fisheries in their regions. These councils, with assistance from the National Marine Fisheries Service (NMFS), establish Essential Fish Habitat (EFH) in FMPs for all managed species. Federal agencies that fund, permit, or implement activities that may adversely affect EFH are required to consult with the NMFS regarding potential adverse effects of their actions on EFH, and respond in writing to recommendations by the NMFS.

Project Applicability: The intertidal habitats adjacent to the Specific Plan area up to the elevation of mean higher high water are considered to be EFH for a number of species that are federally managed under one or more of the following three FMPs:

- Coastal Pelagic FMP – northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), mackerel, squid
- Pacific Groundfish FMP – various rockfish, soles, and sharks
- Pacific Salmon FMP – Chinook salmon (*Oncorhynchus tshawytscha*)

FMP-managed fish species may occasionally enter tidal sloughs adjacent to the Specific Plan area to forage during high tide. However, due to the very narrow and shallow nature of these channels, FMP-managed fish are expected to make limited use of the tidal channels adjacent to the Specific Plan area. Because individual projects may impact EFH, consultation between the USACE and NMFS regarding potential project effects on EFH would occur concurrently with Section 7 consultation under FESA, as described above.

3.1.5 Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA), 16 U.S.C. Section 703, prohibits killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. The MBTA protects whole birds, parts of birds, and bird eggs and nests, and it prohibits the possession of all nests of protected bird species whether they are active or inactive. An active nest is defined as having eggs or young, as described by the USFWS in its June 14, 2018 memorandum "Destruction and Relocation of Migratory Bird Nest Contents". Nest starts (nests that are under construction and do not yet contain eggs) and inactive nests are not protected from destruction.

In recent years, there have been changes to how the MBTA is implemented and enforced with respect to incidental take of protected birds. However, on October 4, 2021, the USFWS published a final rule revoking a January 7, 2021 regulation that limited the scope of the MBTA. The final rule went into effect on December 3, 2021. With this final and formal revocation of the January 7, 2021 rule, the USFWS returns to implementing

the MBTA as prohibiting incidental take and applying enforcement discretion, consistent with judicial precedent.

Project Applicability: All native bird species that occur in the Specific Plan area are protected under the MBTA.

3.2 State Regulations

3.2.1 California Endangered Species Act

The California Endangered Species Act (CESA; California Fish and Game Code, Chapter 1.5, Sections 2050-2116) prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. In accordance with CESA, the California Department of Fish and Wildlife (CDFW) has jurisdiction over state-listed species (Fish and Game Code 2070). The CDFW regulates activities that may result in take of individuals (i.e., "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of take under the California Fish and Game Code. The CDFW, however, has interpreted take to include the "killing of a member of a species which is the proximate result of habitat modification."

Project Applicability: The state endangered California Ridgway's rail and salt marsh harvest mouse are known to occur in the Ravenswood OSP and other marshes located immediately east of the Specific Plan area, and both species likely occur in suitable salt marsh habitat along the eastern edge of the Specific Plan area. In addition, the state threatened California black rail (*Laterallus jamaicensis coturniculus*) has the potential to occur in the same habitats as the California Ridgway's rail and salt marsh harvest mouse. The state threatened longfin smelt may occasionally occur in the unnamed tidal slough, east of the Specific Plan area, as discussed in Section 3.1.3. The state threatened tricolored blackbird (*Agelaius tricolor*) is expected to occur as a nonbreeding visitor, albeit infrequently and in low numbers. There is a low probability that the Crotch's bumble bee (*Bombus crotchii*), a candidate for state listing, breeds in the Specific Plan area. If it does so, it would breed only in very low numbers. More likely, the species occurs only as a forager if it is present at all. The burrowing owl (*Athene cunicularia*), which was designated as a candidate for state listing on October 10, 2024, is not expected to breed in the Specific Plan area but may occur as a migrant and winter visitor.

3.2.2 California Environmental Quality Act

CEQA is a state law that requires state and local agencies to document and consider the environmental implications of their actions and to refrain from approving projects with significant environmental effects if there are feasible alternatives or mitigation measures that can substantially lessen or avoid those effects. CEQA requires the full disclosure of the environmental effects of agency actions, such as approval of a general plan update or the projects covered by that plan, on resources such as air quality, water quality, cultural resources, and biological resources. The State Resources Agency promulgated guidelines for implementing CEQA known as the State CEQA Guidelines.

Section 15380(b) of the State CEQA Guidelines provides that a species not listed on the federal or state lists of protected species may be considered rare if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions in the FESA and the CESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. This section was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the USFWS or CDFW or species that are locally or regionally rare.

The CDFW has produced three lists (amphibians and reptiles, birds, and mammals) of "species of special concern" that serve as "watch lists". Species on these lists are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. They may receive special attention during environmental review as potential rare species, but do not have specific statutory protection. All potentially rare or sensitive species, or habitats capable of supporting rare species, are considered for environmental review per the CEQA Section 15380(b).

The CNPS, a non-governmental conservation organization, has developed CRPRs for plant species of concern in California in the CNPS Inventory of Rare and Endangered Plants. The CRPRs include lichens, vascular, and non-vascular plants, and are defined as follows:

- CRPR 1A Plants considered extinct.
- CRPR 1B Plants rare, threatened, or endangered in California and elsewhere.
- CRPR 2A Plants considered extinct in California but more common elsewhere.
- CRPR 2B Plants rare, threatened, or endangered in California but more common elsewhere.
- CRPR 3 Plants about which more information is needed - review list.
- CRPR 4 Plants of limited distribution-watch list.

The CRPRs are further described by the following threat code extensions:

- .1—seriously endangered in California;
- .2—fairly endangered in California;
- .3—not very endangered in California.

Although the CNPS is not a regulatory agency and plants on these lists have no formal regulatory protection, plants appearing as CRPR 1B or 2 are, in general, considered to meet CEQA's Section 15380 criteria, and adverse effects to these species may be considered significant. Impacts on plants that are listed by the CNPS on CRPR 3 or 4 are also considered during CEQA review, although because these species are typically not as rare as those of CRPR 1B or 2, impacts on them are less frequently considered significant.

Compliance with CEQA Guidelines Section 15065(a) requires consideration of natural communities of special concern, in addition to plant and wildlife species. Vegetation types of "special concern" are tracked in Rarefind (CNDDB 2020). Further, the CDFW ranks sensitive vegetation alliances based on their global (G) and state (S) rankings analogous to those provided in the CNDDB. Global rankings (G1–G5) of natural communities reflect the overall condition (rarity and endangerment) of a habitat throughout its range, whereas S rankings are a reflection of the condition of a habitat within California. If an alliance is marked as a G1–G3, all of the associations within it would also be of high priority. The CDFW provides the Vegetation Classification and Mapping Program's currently accepted list of vegetation alliances and associations (CDFW 2020).

Project Applicability: All potential impacts from future project activities on biological resources will be considered during CEQA review of the project in the context of this Biological Resources Report. Potential impacts from future projects are discussed in Section 6 below.

3.2.3 California Fish and Game Code

Ephemeral and intermittent streams, rivers, creeks, dry washes, sloughs, blue line streams on USGS maps, and watercourses with subsurface flows fall under CDFW jurisdiction. Canals, aqueducts, irrigation ditches, and other means of water conveyance may also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. A *stream* is defined in Title 14, California Code of Regulations Section 1.72, as "a body of water that follows at least periodically or intermittently through a bed or channel having banks and that supports fish and other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation." Using this definition, CDFW extends its jurisdiction to encompass riparian habitats that function as a part of a watercourse. California Fish and Game Code Section 2786 defines *riparian habitat* as "lands which contain habitat which grows close to and which depends upon soil moisture from a nearby freshwater source." The lateral extent of a stream and associated riparian habitat that would fall under the jurisdiction of CDFW can be measured in several ways, depending on the particular situation and the type of fish or wildlife at risk. At minimum, CDFW would claim jurisdiction over a stream's bed and bank. Where riparian habitat is present, the outer edge of riparian vegetation is generally used as the line of demarcation between riparian and upland habitats.

Pursuant to California Fish and Game Code Section 1603, CDFW regulates any project proposed by any person that will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds." California Fish and Game Code Section 1602 requires an entity to notify CDFW of any proposed activity that may modify a river, stream, or lake. If CDFW determines that proposed activities may substantially adversely affect fish and wildlife resources, a Lake and Streambed Alteration Agreement (LSAA) must be prepared. The LSAA sets reasonable conditions necessary to protect fish and wildlife and must comply with CEQA. The applicant may then proceed with the activity in accordance with the final LSAA.

Certain sections of the California Fish and Game Code describe regulations pertaining to protection of certain wildlife species. For example, Code Section 2000 prohibits take of any bird, mammal, fish, reptile, or amphibian except as provided by other sections of the code.

The California Fish and Game Code Sections 3503, 3513, and 3800 (and other sections and subsections) protect native birds, including their nests and eggs, from all forms of take. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered take by the CDFW. Raptors (e.g., eagles, hawks, and owls) and their nests are specifically protected in California under Code Section 3503.5. Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

Bats and other non-game mammals are protected by California Fish and Game Code Section 4150, which states that all non-game mammals or parts thereof may not be taken or possessed except as provided otherwise in the code or in accordance with regulations adopted by the commission. Activities resulting in mortality of non-game mammals (e.g., destruction of an occupied bat roost, resulting in the death of bats), or disturbance that causes the loss of a maternity colony of bats (resulting in the death of young), may be considered take by the CDFW.

Project Applicability: Typically, CDFW does not consider tidal features with no freshwater upstream inputs to fall within its jurisdiction under §1602 of the California Fish and Game Code. Because the tidal slough in Ravenswood OSP that runs along the outside of the Specific Plan area's eastern boundary receives hydrology only from the San Francisco Bay, this feature is not expected to be regulated as a jurisdictional stream by CDFW. No other streams or riparian habitats expected to be regulated by CDFW under §1602 of the California Fish and Game Code are present in the Specific Plan area.

All native bird, mammal, and other wildlife species that occur in the Specific Plan area and in the immediate vicinity are protected by the California Fish and Game Code.

3.2.4 Porter-Cologne Water Quality Control Act

The SWRCB works in coordination with the nine RWQCBs to preserve, protect, enhance, and restore water quality. Each RWQCB makes decisions related to water quality for its region, and may approve, with or without conditions, or deny projects that could affect waters of the state. Their authority comes from the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne). Porter-Cologne broadly defines waters of the state as "any surface water or groundwater, including saline waters, within the boundaries of the state." Because Porter-Cologne applies to any waters, whereas the CWA applies only to certain waters, California's jurisdictional reach overlaps and may exceed the boundaries of waters of the U.S. For example, Water Quality Order No. 2004-0004-DWQ states that "shallow" waters of the state include headwaters, wetlands, and riparian areas. Moreover, the San Francisco Bay Region RWQCB's Assistant Executive Director has stated that, in practice, the RWQCBs claim jurisdiction over riparian areas. Where riparian habitat is not present, as the case may be at headwaters, jurisdiction is taken to the top of bank.

On April 2, 2019, the SWRCB adopted the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. In these new guidelines, riparian habitats are not specifically described as waters of the state but instead as important buffer habitats to streams that conform to the State Wetland Definition. The *Procedures* describe riparian habitat buffers as both important resources that may be included in required mitigation packages for permits for impacts to waters of the state, as well as areas requiring permit authorization from the RWQCBs to impact.

Pursuant to the CWA, projects that are regulated by the USACE must also obtain a Section 401 Water Quality Certification permit from the RWQCB. This certification ensures that the proposed project will uphold state water quality standards. Because California's jurisdiction to regulate its water resources is much broader than that of the federal government, proposed impacts on Waters of the State may require Waste Discharge Requirements even if the area occurs outside of USACE jurisdiction. Moreover, the RWQCB may impose mitigation requirements even if the USACE does not, for example for riparian habitats which are buffers to Waters of the State. Under the Porter-Cologne, the SWRCB and the nine regional boards also have the responsibility of granting CWA National Pollutant Discharge Elimination System (NPDES) permits and Waste Discharge Requirements for certain point-source and non-point discharges to waters. These regulations limit impacts on aquatic and riparian habitats from a variety of urban sources.

Project Applicability: All wetlands and other waters described in Section 3.1.1 as being regulated by the USACE under Section 404 of the CWA would also be considered waters of the state by the RWQCB. In addition, the RWQCB could potentially claim jurisdiction over the banks of the unnamed tidal slough east of the Specific Plan area, up to the top of bank (i.e., upslope from the limits of USACE jurisdiction). Impacts to waters of the state would necessitate 401 water quality certification and/or Porter-Cologne Waste Discharge Requirements for each project that impacts jurisdictional areas.

3.2.5 The McAteer-Petris Act

The McAteer-Petris Act, enacted on September 17, 1965, serves as a legal provision under California state law to preserve San Francisco Bay from indiscriminate filling. The act initially established the San Francisco Bay Conservation and Development Commission (BCDC) as a temporary state agency charged with preparing a plan for the long-term use of the San Francisco Bay. In August 1969, the McAteer-Petris Act was amended to make BCDC a permanent regulatory agency to incorporate the policies of the Bay Plan (BCDC 2012). BCDC jurisdiction includes a 100-ft wide band along the shoreline of the San Francisco Bay. The *shoreline* is defined as all areas that are subject to tidal action from the south end of the San Francisco Bay to the Golden Gate (Point Bonita–Point Lobos), and to the Sacramento River line (a line between Stake Point and Simmons Point, extended northeasterly to the mouth of Marshall Cut). The BCDC will claim all sloughs (specifically, marshlands lying between mean high tide and up to 5 feet above mean sea level where marsh vegetation is present); tidelands (lands between mean high tide and mean low tide); and submerged lands (land lying below mean low tide) in this region. The McAteer-Petris Act also requires that "maximum feasible public access, consistent with a project be included as part of each project to be approved by the BCDC."

Project Applicability: The portions of the unnamed tidal slough, and all other tidal salt marsh along the eastern edge of the Specific Plan area may fall within BCDC's Bay jurisdiction due to their connectivity to San Francisco Bay. BCDC's shoreline jurisdiction extends 100 feet inland from those areas of Bay jurisdiction. Work within BCDC's Bay jurisdiction would require a permit from the BCDC. Coordination with BCDC may be necessary to determine the precise location of BCDC jurisdiction on/near any future project sites within the eastern portions of the Specific Plan area.

3.2.6 State Water Resources Control Board Stormwater Regulation

Construction Phase. Construction projects in California causing land disturbances that are equal to 1 ac or greater must comply with state requirements to control the discharge of stormwater pollutants under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit; Water Board Order No. 2009-0009-DWQ, as amended and administratively extended). Prior to the start of construction/demolition, a Notice of Intent must be filed with the SWRCB describing the project. A Storm Water Pollution Prevention Plan (SWPPP) must be developed and maintained during the project and it must include the use of best management practices (BMPs) to protect water quality until the site is stabilized.

Standard permit conditions under the Construction General Permit requires that the applicant utilize various measures including: on-site sediment control BMPs, damp street sweeping, temporary cover of disturbed land surfaces to control erosion during construction, and utilization of stabilized construction entrances and/or wash racks, among other factors. Additionally, the Construction General Permit does not extend coverage to projects if stormwater discharge-related activities are likely to jeopardize the continued existence or result in take of any federally listed endangered or threatened species.

Post-Construction Phase. In many Bay Area counties, including San Mateo County, projects must also comply with the California RWQCB, San Francisco Bay Region, Municipal Regional Stormwater NPDES Permit (Water Board Order No. R2-2015-0049, as amended). This permit requires that all projects implement BMPs and incorporate Low Impact Development practices into the design that prevent stormwater runoff pollution, promote infiltration, and hold/slow down the volume of water coming from a site. In order to meet these permit and policy requirements, projects must incorporate the use of green roofs, impervious surfaces, tree planters, grassy swales, bioretention and/or detention basins, among other factors.

Project Applicability: Any future projects within the Specific Plan area will comply with the requirements of the NPDES Statewide Storm Water Permit and Statewide General Construction Permit.

3.3 Local Regulations

3.3.1 City of East Palo Alto Tree Protection Policies

According to the City of East Palo Alto Tree Regulations (Municipal Code Chapter 18, Section 18.28.040), it is unlawful for any person to destroy or remove or cause to be destroyed or removed, any protected tree upon

any private or public property in the city without first having obtained a permit to do so. A protected tree is defined as any of the following:

- Any tree having a main stem or trunk which measures –twenty-four inches or greater in circumference at a height of forty inches above grade;
- Any tree within a public street or public right-of-way, regardless of size;
- Any tree that was required to be preserved as a condition of development approval granted by the City;
- Any tree required to be planted as a condition of any development approval granted by the city; and
- Any tree required to be planted as a replacement for any unlawfully removed tree

Project Applicability: Any future projects within the Specific Plan area will comply with the requirements of the City of East Palo Alto's tree protection policies.

3.3.2 Baylands Ecosystem Habitat Goals Project

In 1999, the San Francisco Bay Area Wetlands Ecosystem Goals Project, the United States Environmental Protection Agency (EPA) and the San Francisco RWQCB prepared the Baylands Ecosystem Habitat Goals: A Report of Habitat Recommendations. The purpose of the report is to provide goals and recommendations for the conservation and restoration of tidal wetlands and associated habitats.[1] Broad goals listed that are relevant to the Specific Plan area include:

- Assign high priority (or equal to that of intertidal marsh) to ecological restoration of upper marsh transition zones based on natural models and reference sites.

- Provide sufficient topographic relief adjacent to protected intertidal marsh areas to afford refuge during normal tidal and high flood water depths. This is particularly important in areas where rare and endangered salt marsh vertebrate species are known or likely inhabitants.

- Provide additional upland buffers for the marshes in the Palo Alto area, citing Cooley Landing as the northern limit.

- Increase alien predator management and better marsh corridors or connections between present marshes.

The buffer distance recommendation is specified in the general goals as "at least 300 feet wide between the upper edge of the marsh/upland transition and neighboring areas of developed use" and "[W]where existing land uses or other factors such as steep terrain preclude this, wetland buffers should be no narrower than 100 feet."

[1] It should be noted that these are advisory, not statutory requirements.

The report also includes goals specific to the Mountain View Segment, which includes the Specific Plan area. Mountain View Segment goals that are relevant to the Specific Plan area include:

- Restore large areas of tidal marsh and provide a continuous corridor of tidal marsh along the bayshore.

- Provide more and wider buffers to tidal marshes, and improve management to reduce human intrusion and predators.

In addition, the report makes the following recommendation for the bayshore environment in the Specific Plan area.

"The marshes between Charleston Slough to Cooley Landing in the Palo Alto Sector, including the Palo Alto Education Center Marsh, need more upland buffers, better protection from illegal entry, more alien predator management and better marsh corridors or connections between present marshes. Again, the 100-yard minimum rule and appropriate vegetation rule applies to both buffers and upper edges. The Palo Alto Marsh continues to change in vegetation (for the worse) and the upland edge of the marsh is very abrupt and needs modification."

Project Applicability: Any future projects within the Specific Plan area will consider the goals and recommendations as set forth in the Baylands Ecosystem Habitat Goals Report.

3.3.3 Vista 2035 East Palo Alto General Plan

The City of East Palo Alto's Vista 2035 General Plan includes goals and policies for the conservation of natural resources. The Parks, Open Space, and Conservation element of the General Plan includes the following policies:

- **Policy 4.2: Human activities.** Protect wildlife from adverse impacts caused by human activities.

- **Policy 4.7: Native species.** Encourage or require the use of native and/or non-invasive plants in privately built landscaping or new open spaces near natural open space areas, in order to provide foraging, nesting, breeding, and migratory habitat for wildlife. Discourage use of herbicides and fertilizers.

- **Policy 4.8: Interagency coordination.** Coordinate with other public agencies such as the San Francisquito Creek Joint Powers Authority, Army Corps of Engineers, National Fish and Wildlife Service, and other similar entities on construction or development activities occurring within or adjacent to the City.

- **Policy 4.9: Riparian and flood buffer.** Do not allow new development within a 100-foot buffer zone from the top of the San Francisquito creek bank.

- **Policy 6.2: New tree planting.** Prioritize the planting of new trees on sites designated as sensitive receptors (e.g. schools, health centers) or that are in close proximity to sources of air pollution such as freeways and heavily trafficked road corridors.

Project Applicability: Any future projects within the Specific Plan area will consider the goals and policies for the conservation of natural resources as set forth in the Conservation and Open Space Element of the City of East Palo Alto's General Plan.

Section 4. Environmental Setting

In this section we describe the existing conditions of the Specific Plan area with respect to dominant habitats, common/typical plant and animal species, special-status species, and regulated/sensitive habitats. Where descriptions of existing conditions in the 2012 EIR are still accurate and applicable, we have largely re-used those descriptions for the sake of consistency. Where our findings differ from those provided in the 2012 EIR, we have noted those differences.

4.1 General Project Area Description

The 207-ac Specific Plan area is located in the City of East Palo Alto in San Mateo County, California and occurs within the *Palo Alto* and *Mountain View*, *California* U.S. Geological Survey (USGS) 7.5-minute quadrangles. The Specific Plan area includes areas of residential and industrial urban development, as well as undeveloped areas adjacent to tidal marsh and upland habitats to the north and east. The Stanford Fill, an area that includes a mound of fill soil approximately 6 ac in size, is located in the center of the Specific Plan area. The mound of fill is approximately 16 to 27 ft in height with relatively steep sides. The area supports nonnative grassland/ruderal upland vegetation. Vegetation extending to the east of this mound transitions from upland species to salt marsh habitat. Adjacent to the Specific Plan area is the Ravenswood OSP, a 270-ac preserve that includes a restored former salt pond that is owned and managed by the Midpeninsula Regional Open Space District. The preserve supports a portion of the Bay Trail, which is open to the public, and intact salt marsh habitat and a host of wildlife species dependent on this habitat type. Beyond the preserve to the east are the open waters of the San Francisco Bay, with extensive areas of mud flats during low tides.

The climate within the region is Mediterranean, with moist, mild winters and dry summers. Average precipitation in East Palo Alto is 16 inches per year and average temperatures range from 49 to 70 °F. Locations along the bay are often windy.

4.2 Biotic Habitats

The Specific Plan area supports four general habitat/land use types: 1) northern coastal salt marsh and 2) open water/tidal slough (which together total 22.1 ac); 3) nonnative grassland/ruderal (46.0 ac); and 4) urban landscape (138.9 ac). In some areas, such as along the northwestern and northeastern boundaries of the Specific Plan area and south of the railroad tracks, upland habitat is interspersed with low areas (depressions) that support wetland vegetation. A wetland delineation would be necessary to accurately map wetland habitats as well as determine agency jurisdiction.

The 2012 EIR included two habitat types within urban areas: "barren/ruderal" and "urban landscape". However, our examination of the sites that had been designated as "barren/ruderal" in 2012 showed no substantial differences in habitat conditions from the sites that were considered nonnative grassland/ruderal, and therefore, we have mapped all upland areas dominated by grasses and other (primarily nonnative)

herbaceous plants as nonnative grassland/ruderal. The extent of the areas that were considered barren/ruderal habitat in 2012 have changed since then due to development of some infill parcels, as follows: 1) a housing complex is now located in the south end of the Specific Plan area, located between Maple Place and Pulgas Avenue; 2) the EPA Center (i.e., East Palo Alto youth center), located at the corner of Bay Road and Pulgas Avenue; and 3) an extension of the Ravenswood Family Health Center and associated parking lot, located north of Bay Road and west of Pulgas Avenue. In addition, a small portion of nonnative grassland/ruderal habitat in the far southeast corner of the Specific Plan area, located north of Runnymede Street, is now a single family home; the field directly east of this home, which was mapped as urban landscape habitat in 2012, is now occupied by nonnative grassland. These habitats/land use types are described in detail below (using text from the 2012 EIR to the extent it is still accurate and applicable), and their locations are shown on Figure 4.

4.2.1 Northern Coastal Salt Marsh

Vegetation. Salt marshes are transitional areas between land and water, and northern coastal salt marsh occurs along the north and east margin of the Specific Plan area adjacent to the San Francisco Bay. Northern coastal salt marsh habitat is typically dominated by a small number of hydrophytic and herbaceous plant species forming a dense cover. This habitat type has been significantly reduced in size within the San Francisco Bay since European settlement and development/filling of the bay. Remaining salt marsh habitat is highly valued for its function in maintaining a healthy bay ecosystem. Northern coastal salt marsh habitat supports a variety of wildlife species and provides critical filtration of sediments and toxins from the water. Decaying salt marsh vegetation provides a source of nourishment for bacteria and invertebrates, and remaining detritus provides fertilizer for regeneration of marsh vegetation.

Photo 1. Looking northeast from Bay Road towards salt marsh habitat.

Vegetation within the salt marsh is segregated into zones influenced by the amount of tidal inundation. The lower zone (to mean high tide) is characterized by cordgrass (*Spartina* spp.), the middle zone (from mean high tide to higher tide) is characterized by pickleweed (*Salicornia* spp.), and the upper zone is typified by saltgrass (*Distichlis spicata*). Other species found within the Specific Plan area in the middle and upper salt marsh zones include marsh gum-plant (*Grindelia stricta* var. *angustifolia*), alkali heath (*Frankenia salina*), dodder (*Cuscuta salina*), salt marsh fleabane (*Pluchea odorata*), cattail (*Typha angustifolia*), fat hen (*Atriplex triangularis*), and alkali weed (*Cressa truxillensis*), among others.

The northeast part of the Specific Plan area, between University Village and Ravenswood OSP, supports primarily northern coastal salt marsh habitat. The very northwest corner of the Specific Plan area supports an area of salt marsh habitat, and the Specific Plan area's north boundary, between the edge of the University

Village neighborhood and the railroad tracks, supports upland vegetation with scattered, low-lying areas that contain salt marsh vegetation (Photo 1).

Wildlife. Northern coastal salt marsh habitat supports a variety of bird species, both resident and migratory. Species occurring within this habitat adjacent to and within the Specific Plan area include a variety of shorebirds such as American avocet (*Recurvirostra americana*), willet (*Tringa semipalmata*), black-necked stilt (*Himantopus mexicanus*), long-billed curlew (*Numenius americanus*), short-billed dowitcher (*Limnodromus griseus*), and several sandpipers, as well as grebes, egrets, and herons. A diversity of ducks frequent the South Bay, and those occurring within salt marsh habitat in the Specific Plan area include American wigeon (*Mareca americana*), northern shoveler (*Spatula clypeata*), mallard (*Anas playtrhynchos*), and green-winged teal (*Anas crecca*). Raptors typically found in South Bay salt marsh habitats include the northern harrier (*Circus hudsonius*) and American kestrel (*Falco sparverius*). Mammals found in this habitat include the California vole (*Microtus californicus*), western harvest mouse (*Reithrodontomys megalotis*), and black-tailed jackrabbit (*Lepus californicus*), among others. Northern coastal salt marsh also provides habitat for several special-status San Francisco Bay species, as described in Section 5.2 below.

Northern coastal salt marsh is considered a sensitive community by CDFW due to the extensive loss of salt marsh habitat throughout California, and due to the high level of productivity within this community and its crucial role in supporting bay and ocean health.

4.2.2 Open Water/Tidal Slough

Vegetation. Within the salt marsh habitat is a network of channels and sloughs supporting open water (Photo 2). Unlike a salt marsh, open water is not a vegetation community, but a distinct habitat type within the salt marsh. The open water/tidal sloughs on-site are tidally influenced, and thus water levels change with the changing tide. Two areas of ponded water associated with this network and close to the urban interface are found at the terminus of Stevens Avenue, north of the Stanford Fill, and northeast of the University Village neighborhood, approximately 175 ft northwest of the terminus of Fordham Street, where a recently constructed pedestrian bridge crosses a pond in the Ravenswood OSP.

Photo 2. Snowy egrets (*Egretta thula*) foraging along the tidal slough located east of the Specific Plan area.

Wildlife. Open water/tidal sloughs within the Specific Plan area support many of the same species found within the salt marsh habitat. Shorebirds may forage in the sloughs during low tide, and other types of birds, such as ducks and egrets, use the open water habitats during both low and high tide. Aquatic species such as invertebrates and fish occur in the open water habitats on-site.

4.2.3 Nonnative Grassland/Ruderal

Photo 3. Looking north from the terminus end of Demeter Street towards the Stanford Fill area – representative of the non-native grassland/ruderal habitat, which then transitions to salt marsh habitat to the east.

Vegetation. Portions of the upland habitat within the Specific Plan area are composed of nonnative annual grassland/ruderal habitat. Ruderal vegetation and nonnative annual grassland are mixed plant communities in which the native vegetation has been modified by grading, cultivation, grazing, or other surface disturbances. Such areas, if left undeveloped, may be colonized by invasive exotic species, as well as by certain native species. The native vegetation may ultimately become at least partially restored if the soils are left intact and there is no continued disturbance. This habitat community is found on the Stanford Fill (Photo 3) as well as upland areas that occur between salt water marsh and the University Village and Ravenswood Industrial neighborhoods, and other undeveloped "infill" parcels. Some woody vegetation occurs in this area as well, such as coyote brush (*Baccharis pilularis*) and coast live oak (*Quercus agrifolia*). Non-native annual grassland/ruderal habitat is also found north of University Village. As described above, areas of salt marsh are interspersed in the upland area located north of University Village and south of the railroad tracks.

Vegetation species found in the Specific Plan area within nonnative annual grassland habitat include curly dock (*Rumex crispus*), peppergrass (*Lepidium oxycarpum*), ice plant (*Carpobrotus edulis*), fennel (*Foeniculum vulgare*), bristly ox-tongue (*Picris echioides*), wild radish (*Raphanus sativa*), Italian ryegrass (*Lolium multiflorum*), wild oat (*Avena fatua*) and yellow star thistle (*Centaurea solstitialis*), among others. Occasional woody species also occur, including coast live oak, coyote bush, and olive (*Olea europaea*).

Wildlife. Wildlife use of nonnative annual grassland/ruderal habitats within the Specific Plan area is limited by human disturbance, the small extent of the grassland area, and the isolation of these habitat remnants from more extensive grasslands. Many of the bird species that occur in the small grassland areas in the Specific Plan area occur primarily in adjacent ornamental woodland areas and use these grasslands for foraging. Such species include the house finch (*Haemorhous mexicanus*), bushtit (*Psaltriparus minimus*), and lesser goldfinch (*Spinus psaltria*), which forage on seeds in grassland areas, and the black phoebe (*Sayornis nigricans*), cliff swallow (*Petrochelidon pyrrhonota*), and Mexican free-tailed bat (*Tadarida brasiliensis*), which forage aerially over grassland habitats for insects.

Rodent species that could potentially occur in this habitat include the California vole, Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Otospermophilus beecheyi*), and deer mouse (*Peromyscus maniculatus*). Raptors such as red-tailed hawks (*Buteo jamaicensis*) and barn owls (*Tyto alba*) forage for these small mammals over the grasslands. Mammals such as the native striped skunk (*Mephitis mephitis*) and raccoon (*Procyon lotor*), and

nonnative Virginia opossum (*Didelphis virginiana*) also use grassland habitats in the Specific Plan area for foraging. Reptiles such as western fence lizards (*Sceloporus occidentalis*) and western terrestrial garter snakes (*Thamnophis elegans*) frequent grassland habitats, and may occur in the Specific Plan area.

4.2.4 Urban Landscape

Vegetation. The majority of the Specific Plan area is composed of developed urban landscape land-use types, with little to no native vegetation communities. The urban area is a mix of residences, small businesses, and industrial development (Photo 4). Various ornamental plant species, as well as some natives, are found within the urban setting within landscaped features and street strips. For example, blue gum eucalyptus trees (*Eucalyptus globulus*) and sweet gum (*Liquidambar styraciflua*) are common, and native coast live oak occurs infrequently.

Photo 4. Ravenswood Health Center on Bay Road is an example of the Urban Landscape land-use type within the Specific Plan area, surrounded by ornamental trees, a community garden and other vegetation.

Wildlife. A variety of urban-adapted bird species are associated with nonnative, ornamental trees, which are used for nesting, roosting, and foraging. Those species include the Anna's hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottos*), bushtit, and Bewick's wren (*Thryomanes bewickii*). Other common wildlife species that may occur in the understory are similar to those described under the nonnative grassland/ruderal habitat above.

4.3 Wildlife Movement

The 2012 EIR did not discuss baseline conditions for wildlife movement; this section provides such a discussion. Wildlife movement within and in the vicinity of the project footprint takes many forms, and is different for the various suites of species associated with these lands. Bats, and most bird species, move readily over the landscape in the project vicinity, foraging over and within both natural lands and landscaped areas. Mammals of different species move within their home ranges, but also disperse between patches of habitat. Generally, reptiles and amphibians similarly settle within home ranges, sometimes moving to central breeding areas, upland refugia, or hibernacula in a predictable manner, but also dispersing to new areas. Some species, especially among the birds and bats, are migratory, moving into or through the project vicinity during specific seasons. Aside from bats, there are no other mammal species in the vicinity of the Specific Plan area that are truly migratory. However, the young of many mammal species disperse from their natal home ranges, sometimes moving over relatively long distances in search of new areas in which to establish.

Movement corridors are segments of habitat that provide linkage for wildlife through the mosaic of suitable and unsuitable habitat types found within a landscape while also providing cover. On a broader level, corridors also function as paths along which wide-ranging animals can travel, populations can move in response to environmental changes and natural disasters, and genetic interchange can occur. In California, environmental corridors often consist of riparian areas along streams, rivers, or other natural features, although any relatively contiguous area with suitable cover and other necessary resources may serve as a corridor as long as no barriers to dispersal are present.

Due to the density of development and the lack of continuous, well-vegetated pathways through urbanized East Palo Alto and its surroundings, there are currently no well-defined movement corridors for mammals, amphibians, or reptiles within or through the majority of the Specific Plan area. Urban-adapted wildlife species such as raccoons, striped skunks, and western fence lizards that reside in the urban landscape and nonnative grassland/ruderal habitats may move through the Specific Plan area using cover and refugia as they find them available. Although roads, fences, and buildings constrain such movements, these urban-adapted species are able to move within and throughout the majority of the Specific Plan area, either during longer dispersal events or over time and generations. Longer-distance, more regionally important dispersal is expected to occur only along higher-quality, more natural habitats with few impediments to movement. In the Specific Plan area, such dispersal would occur only along the northern and eastern borders (e.g., along the rail line comprising the northern boundary of the Specific Plan area and along the eastern upland/wetland interface adjacent to the Ravenswood OSP and Baylands Preserve). These areas provide movement pathways for a variety of animals, including some larger mammals capable of long-distance movements, such as black-tailed jackrabbits, coyotes (*Canis latrans*), and gray foxes (*Urocyon cinereoargenteus*). Vegetative cover for larger mammals, such as dense shrubs or tall herbaceous vegetation, is sparse along these movement pathways. Although jackrabbits may find enough cover to reside in such areas, gray foxes and coyotes are expected to occur along the northern and eastern edges of the Specific Plan area primarily during relatively quick, longer-distance movements between higher-quality habitat patches outside the Specific Plan area.

The wetlands along the edge of the San Francisco Bay comprise one of the most important coastal wintering and migratory stopover foraging habitats for Pacific Flyway shorebirds and waterfowl, most of which do not breed in the Bay but which use it during migration and in winter for feeding and resting. The San Francisco Bay supports higher proportions of the total wintering and migrating shorebirds on the U.S. Pacific coast than any other wetland (Western Hemisphere Shorebird Reserve Network 2009). Hundreds of thousands of shorebirds and approximately 25 species of waterfowl making their way south from the Arctic, Alaska, and western Canada pass through the region in the fall. The Western Hemisphere Shorebird Reserve Network has designated the San Francisco Bay Estuary as a site of "Hemispheric Importance" (its highest ranking), and the North American Waterfowl Management Plan has listed it as one of 34 waterfowl habitats of major concern in North America. The tidal salt marshes in and adjacent to the Specific Plan area (Ravenswood OSP and Baylands Preserve) are valuable resources for these migratory birds, and they are expected to be present in high abundance during winter and migration.

Migratory birds, including terrestrial species and waterbirds associated with the Bay, migrate along the edge of San Francisco Bay. For example, nocturnal migrant birds that find themselves over the Bay in the morning will seek roosting and foraging areas along the edge of the Bay. As a result, numbers of migrant birds moving through/past the Specific Plan area would be higher than expected based on the low quality of habitat currently present in the majority of its urbanized areas (see section 6.4.2 for further discussion).

4.4 Non-Native and Invasive Species

A number of nonnative invasive plant species occur in the Specific Plan area. Of these, perennial peppergrass (*Lepidium latifolium*), ice plant (*Carpobrotus edulis*), and yellow star-thistle (*Centaurea solstitialis*) have the potential to cause the most severe ecological impacts. In addition, fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), and wild oats (*Avena fatua*) were observed in the Specific Plan area and can have substantial and apparent ecological impacts if they spread into native, sensitive habitats (Cal-IPC 2022). Non-native cordgrass, particularly smooth cordgrass (*Spartina alterniflora*), has invaded much of San Francisco Bay, and in many areas it has displaced the native California cordgrass (*Spartina foliosa*). Smooth cordgrass and/or hybrid smooth x California cordgrass is present in salt marsh along the eastern edge of the Specific Plan area (Rohmer and Kerr 2021). The remainder of the project vicinity is developed/landscaped, and invasive species would not result in adverse effects on developed and landscaped areas. All of these species are also present in abundance throughout the region and in areas surrounding the Specific Plan area.

In addition to nonnative plants, nonnative animals occur in the Specific Plan area. Nonnative animals such as house mice (*Mus musculus*), Norway rats, black rats, and feral cats can compete with and/or prey upon sensitive native animals. These nonnative animals occur most abundantly in and near developed, urban habitats where they obtain food from anthropogenic sources, though they can also reside in more natural habitats, such as salt marsh and grassland, where sufficient food is present.

Section 5. Special-Status Species and Sensitive Habitats

CEQA requires assessment of the effects of a project on species that are protected by state, federal, or local governments as "threatened, rare, or endangered;" such species are typically described as "special-status species." For the purpose of the environmental review of projects proposed under the Amendment, special-status species have been defined as described below. Impacts on these species are regulated by some of the federal, state, and local laws and ordinances described in Section 3 above.

For purposes of this analysis, "special-status" plants are considered plant species that meet one or more of the following criteria:

- Listed under the Federal Endangered Species Act (FESA) as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
- Listed under the California Endangered Species Act (CESA) as threatened, endangered, rare, or a candidate species.
- Listed by the CNPS as CRPR 1A, 1B, 2, 3, or 4.

For purposes of this analysis, "special-status" animals are considered animal species that meet one or more of the following criteria:

- Listed under FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
- Listed under CESA as threatened, endangered, or a candidate threatened or endangered species.
- Designated by the CDFW as a California species of special concern.
- Listed in the California Fish and Game Code as fully protected species (fully protected birds are provided in Section 3511, mammals in Section 4700, reptiles and amphibians in Section 5050, and fish in Section 5515).

Information concerning threatened, endangered, and other special-status species that potentially occur in the Specific Plan area was collected from several sources and reviewed by H. T. Harvey & Associates biologists as described in Section 2.1 above. Figure 5 depicts CNDDB records of special-status plant species in the general vicinity of the Specific Plan area and Figure 6 depicts CNDDB records of special-status animal species. These generalized maps show areas where special-status species are known to occur or have occurred historically.

Figure 5. CNDDB-Mapped Records of Special-Status Plants

Figure 6. CNDDB-Mapped Records of Special-Status Animals

5.1 Special-Status Plant Species

A search of all CRPR rank 1, 2, 3, and 4 species identified a number of special-status plant species as having potential to occur within the Specific Plan area vicinity. However, the Specific Plan area and surrounding areas are dominated by heavily disturbed anthropogenic land uses (i.e., developed/landscaped areas), which preclude the presence of most special-status plant species that occur in more natural habitats in the region. The 2012 EIR identified four species that could potentially occur within the Specific Plan area. Their historical CNDDB occurrence locations are shown on Figure 5. Although three of these species – alkali milk vetch (*Astragalus tener* var. *tener*), Point Reyes bird's beak (*Cordylanthus maritimus* ssp. *palustris*), and California seablite (*Suaeda californica*) – occur in habitats that are present in the Specific Plan area, these species have not been recorded in the project vicinity for decades. While alkali milk vetch and Point Reyes bird's beak cannot be ruled out as potentially occurring (no focused surveys for these species have been conducted in suitable habitat in the Specific Plan area), we consider California seablite to be extirpated from the region; all known remaining populations except one are restoration populations, the locations of all remaining populations are well known, and the species requires active tidal action to colonize previously unknown sites and persist. Due to the absence of high-quality habitat and the lack of any known populations from the vicinity, California seablite is considered absent from the Specific Plan area.

Only one species, Congdon's tarplant, has a high potential for occurrence in the Specific Plan area. Congdon's tarplant is a CNPS List 1B.2 plant, with no FESA or CESA status. Congdon's tarplant is known from eight central California coastal counties, including San Mateo County. The species occurs in alkaline soils in valley and foothill grasslands, typically in sumps and disturbed sites where water collects. Congdon's tarplant is often associated with nonnative grassland species, including mustard (*Brassica* spp.) and star-thistle (*Centaurea* spp.). A small population of Congdon's tarplant was reported within the Specific Plan area in 2001. Seventeen plants were observed in the Specific Plan area within upland habitat located approximately behind the address of 2888 Illinois Street. Focused rare plant surveys in 2018 and 2019, however, failed to detect any individual Congdon's tarplants in this location. Instead, the population was observed to consist solely of the very similar common spikeweed (*Centromadia pungens* ssp. *pungens*) (H. T. Harvey & Associates 2019). Nevertheless, suitable habitat is present in this location and similar upland nonnative grasslands near the eastern margin of the Specific Plan area, and this species may occur in these habitats. Additionally, the species may occur in ruderal/barren habitats throughout the Specific Plan area.

All other special-status plant species identified as potentially occurring in the region were determined to be absent from the Specific Plan area for at least one of the following reasons: (1) absence of suitable habitat types; (2) lack of specific microhabitat or edaphic requirements, such as serpentine soils; (3) the elevation range of the species is outside of the range in the Specific Plan area; and/or (4) the species is considered extirpated from the project region.

5.2 Special-Status Animal Species

The 2012 EIR concluded that 10 special-status animal species could potentially occur in the Specific Plan area: the burrowing owl, western snowy plover (*Charadrius nivosus nivosus*), San Francisco common yellowthroat (*Geothlypis trichas sinuosa*)[2], Alameda song sparrow (*Melospiza melodia pusillula*), California black rail (*Laterallus jamaicensis coturniculus*), California Ridgway's rail (*Rallus obsoletus obsoletus*)[3], California least tern (*Sternula antillarum browni*), pallid bat (*Antrozous pallidus*), salt marsh harvest mouse (*Reithrodontomys raviventris*), and salt marsh wandering shrew (*Sorex vagrans halicoetes*). We address these 10 species below in Table 1 along with several additional special-status animal species that we have evaluated for potential occurrence in the Specific Plan area and vicinity. Table 1 provides the current listing status, species description, and potential for occurrence in the Specific Plan area.

A number of special-status bird and mammal species can occasionally occur in the Specific Plan area as nonbreeding foragers, but they do not breed or occur in large numbers in the Specific Plan area. These are the California least tern, loggerhead shrike (*Lanius ludovicianus*), tricolored blackbird, pallid bat, Townsend's big-eared bat (*Corynorhinus townsendii*), and western red bat (*Lasiurus blossevillii*). The monarch butterfly could potentially breed in the Specific Plan area if its larval hostplant milkweed (*Asclepias* spp.) is present, though it likely occurs primarily as an uncommon migrant. Similarly, there is a low probability that the Crotch's bumble bee breeds in the Specific Plan area, and it likely occurs only as a forager if it is present at all. The green sturgeon, longfin smelt, and Central California coast steelhead may occur as occasional foragers, migrants, or transients in the unnamed tidal slough east of the Specific Plan area in Ravenswood OSP. None of these species is expected to breed in or regularly use habitats in or near areas slated for development within the Specific Plan area, and the areas where development could potentially occur in the Specific Plan area do not provide important habitat for these species.

The western snowy plover, California Ridgway's rail, California black rail, salt marsh harvest mouse, salt marsh wandering shrew, Alameda song sparrow, San Francisco common yellowthroat, Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*), burrowing owl, northern harrier (*Circus hudsonius*), and white-tailed kite (*Elanus leucurus*) are addressed in greater detail in this report because these species can potentially breed or occur in or immediately adjacent to the Specific Plan area and/or they may be significantly impacted by projects within the Specific Plan area (see Section 6 *Impacts and Mitigation Measures* below).

[2] Formerly known as the saltmarsh common yellowthroat
[3] Formerly known as the California clapper rail (*Rallus longirostris obsoletus*)

Table 1. Special-Status Animal Species, Their Status, and Potential Occurrence On or Adjacent to the Project Site

Name	*Status	Habitat	Potential for Occurrence in Specific Plan Area
Federal or State Endangered, Threatened, or Candidate Species			
Crotch's bumble bee (*Bombus crotchii*)	SC	Open grassland and scrub habitats with abundant flowers providing nectar and pollen and with subterranean nest sites (such as animal burrows).	**Low (Likely Absent as Breeder).** Although this species has been recently recorded as close to the site as the Palo Alto Baylands, 1.7 miles to the southeast of the Specific Plan area (Bumble Bee Watch 2023, iNaturalist 2023), habitat quality in the Specific Plan area is low due to the absence of extensive, high-quality floral resources and the developed or wetland nature of most of the area, thus minimizing potential for nesting. Therefore, there is a low probability that the species breeds in the Specific Plan area. If it does so, it would breed only in very low numbers. More likely, the species occurs only as a forager if it is present at all.
Monarch butterfly (*Danaus plexippus*)	FC	Requires milkweed (*Asclepias* spp.) for egg-laying and larval development, but adults obtain nectar from a wide variety of flowering plants in many habitats. Individuals congregate in winter roosts, primarily in Mexico and in widely scattered locations on the central and southern California coast.	**Moderate (May be Present as Scarce Breeder).** In 2012, the monarch butterfly had no listing or legal designation as a special-status species, and this species was not discussed in the 2012 EIR. On December 14, 2020, the USFWS announced that listing the monarch butterfly as endangered or threatened under FESA was warranted, but precluded by higher priority listing actions. Thus, the monarch butterfly is now a candidate species under FESA, and the USFWS will review its status annually until a listing decision is made. The monarch butterfly occurs within the Specific Plan area vicinity primarily as a migrant, though small numbers breed in some parts of the South Bay. No current or historical overwintering concentrations are known in San Mateo County, and no larval host plants (*Asclepias* spp.) were observed in the Specific Plan area during the July, 2022 reconnaissance surveys. Small numbers of adults may nectar within the Specific Plan area, especially during spring and fall migration, and a very small number of individuals may breed in the Specific Plan area if milkweed (including milkweed planted in residential areas) is present.

Name	*Status	Habitat	Potential for Occurrence in Specific Plan Area
Green sturgeon (*Acipenser medirostris*)	FT, CSSC	Spawns in large river systems such as the Sacramento River; forages in nearshore oceanic waters, bays, and estuaries.	**Absent (May be Present in Adjacent Areas).** No suitable habitat is present in or immediately adjacent to the majority of the Specific Plan area, as the tidal sloughs are too narrow and shallow to provide suitable foraging habitat for this species. Designated critical habitat is present within the Specific Plan area in an unnamed tidal slough adjacent to the Specific Plan area where this tidal slough parallels the eastern boundary.
Longfin smelt (*Spirinchus thaleichthys*)	FP, ST	Spawns in fresh water in the upper end of the Bay; occurs year-round in the South Bay.	**Absent (May be Present in Adjacent Areas).** No suitable habitat is present in the Specific Plan area itself. This species may occasionally forage within an unnamed tidal slough adjacent to the Specific Plan area, albeit infrequently and in low numbers (if at all) given the shallow and narrow nature of aquatic habitat within the slough.
Central California Coast steelhead (*Oncorhynchus mykiss*)	FT	Cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats.	**Absent (May be Present in Adjacent Areas).** No suitable habitat is present in the Specific Plan area itself. Individuals of this species may be present as occasional foragers in an unnamed tidal slough adjacent to the Specific Plan area during high tides, and designated critical habitat is present in that slough.
Northwestern pond turtle (*Actinemys marmorata*)	FP, CSSC	Permanent or nearly permanent water in a variety of habitats.	**Absent.** There are a number of CNDDB (2022) records of the species from San Mateo County, all from the western part of the County, with the closest record of the species from San Francisquito Creek, near Stanford University, approximately 4 mi southwest of the Specific Plan area. Major roads, highways, and developed areas create impassable barriers to dispersal of this species from known locations found west of the Specific Plan area. In addition, no suitable aquatic habitat is present within the Specific Plan area. Aquatic habitats that are found within and adjacent to the Specific Plan area are too brackish for the species to persist in the Specific Plan area vicinity. Determined to be absent.

Name	*Status	Habitat	Potential for Occurrence in Specific Plan Area
Western snowy plover (*Charadrius nivosus nivosus*)	FT, CSSC	Sandy beaches on marine and estuarine shores and salt pannes in Bay saline managed ponds.	**Absent (Present in Adjacent Areas).** The 2012 EIR determined that this species had a moderate potential to occur in the Specific Plan area due to known occurrences at San Francisquito Creek. However, no suitable habitat for this species is present in the Specific Plan area itself. Rather, the species could potentially occur in Pond SF 2 at the Ravenswood Complex of the Don Edwards National Wildlife Refuge, in salt pannes immediately north of the Specific Plan area (CNDDB 2022). Thus, the species may nest close enough to the Specific Plan area to be affected by Specific Plan activities.
California black rail (*Laterallus jamaicensis coturniculus*)	ST, SP	Breeds in fresh, brackish, and tidal salt marsh.	**Moderate (May be Present as Breeder).** The 2012 EIR determined that California black rail has a high potential to occur in the Specific Plan area. Few black rails have been observed in marshes on the east side of the San Francisco peninsula, and most recent records are from the nonbreeding season (CNDDB 2022). Nevertheless, ostensibly suitable foraging and breeding habitat occurs within tidal marshes in the Specific Plan area, and this secretive species may breed in small numbers in these marshes.
California Ridgway's rail (*Rallus obsoletus obsoletus*)	FE, SE, SP	Salt marsh habitat dominated by pickleweed (*Salicornia* spp.) and cordgrass (*Spartina* spp.).	**High (May be Present as Breeder).** The 2012 EIR determined that the California Ridgway's rail has a high potential to occur in the Specific Plan area. Breeding season records of California Ridgway's rail are present throughout the tidal marshes adjacent to the Specific Plan area (CNDDB 2022, Cornell Lab of Ornithology 2022), and this species was observed foraging in tidal channels in the northeast portion of the Specific Plan area in 2020 by H. T. Harvey & Associates ecologists. Suitable foraging habitat is present in the tidal marshes in the northeast portion of the Specific Plan area, and there is at least a low potential for the species to nest in the Specific Plan area, though nesting habitat is of much higher quality in mature tidal marshes immediately to the east.

Name	*Status	Habitat	Potential for Occurrence in Specific Plan Area
California least tern (*Sternula antillarum browni*)	FE, SE, SP	Nests along the coast on bare or sparsely vegetated, flat substrates. In the South Bay, nests in salt pannes and on an old airport runway. Forages for fish in open waters.	**Low (Absent as Breeder)**. Least terns were known to nest at salt evaporation ponds approximately 1.5 mi to the west of the Specific Plan area from 1975–1976 and at Outer Bair Island approximately 5 mi to the northwest in some years from 1969–1982 (CNDDB 2022), but they are no longer known to nest at these locations. The species has never been recorded in the Specific Plan area itself (Cornell Lab of Ornithology 2022, CNDDB 2022). Least terns forage primarily in managed ponds and over the open San Francisco Bay and have not been observed foraging in narrow tidal sloughs (such as the unnamed tidal slough adjacent to the eastern boundary of the Specific Plan area at Ravenswood OSP). Least terns are not known or expected to nest or forage in or adjacent to the Specific Plan area.
Tricolored blackbird (*Agelaius tricolor*)	ST	Nests near fresh water in dense emergent vegetation.	**Low (Absent as Breeder).** Tricolored blackbirds typically nest in extensive stands of tall emergent herbaceous vegetation in nontidal freshwater marshes and ponds, which are not present on or immediately adjacent to the Specific Plan area. This species is not known to nest in tidal habitats in Santa Clara and San Mateo County, and has not been recorded nesting on or near the Specific Plan area (CNDDB 2022, Cornell Lab of Ornithology 2022). However, small numbers of tricolored blackbirds may forage in the Specific Plan area (e.g., in grasslands and marsh habitats) during the nonbreeding season.
Salt marsh harvest mouse (*Reithrodontomys raviventris*)	FE, SE, SP	Salt marsh habitat dominated by common pickleweed or alkali bulrush; recent studies have indicated that the species also utilizes brackish marshes, non-tidal managed wetlands, and some adjacent upland habitats (Smith 2019).	**High.** The species is known to occur in tidal marshes in and adjacent to the Specific Plan area (CNDDB 2022, Shellhammer 2005). Suitable salt marsh habitat occurs in the northeastern portion of the Specific Plan area, adjacent to the eastern boundary of the Specific Plan area in the Ravenswood OSP. Suitable habitat is also present along the tidal slough east of the Specific Plan area. Salt marsh harvest mice may also forage in upland grasslands immediately adjacent to marsh habitats, and may take refuge in these habitats during high tides.

California Species of Special Concern			
Burrowing owl (*Athene cunicularia*)	SC	Nests and roosts in open grasslands and ruderal habitats with suitable burrows, usually those made by California ground squirrels (*Otospermophilus beecheyi*).	**Low (Absent as Breeder).** No records of breeding burrowing owls are known within or surrounding the Specific Plan area (CNDDB 2022, Cornell Lab of Ornithology 2022). While ostensibly suitable burrowing owl roosting or nesting habitat (i.e., open grasslands and ruderal habitats with ground squirrel burrows) is present in the Specific Plan area, the species is not expected to nest here due to lack of breeding records for this heavily monitored species. Although occasional migrant burrowing owls could forage and/or overwinter within the Specific Plan area, they are expected to do so only infrequently and in small numbers, if at all.
San Francisco common yellowthroat (*Geothlypis trichas sinuosa*)	CSSC	Nests in herbaceous vegetation, usually in wetlands or moist floodplains.	**High (Present as Breeder).** Common yellowthroats occur year-round in the marshes within and surrounding the Specific Plan area (Cornell Lab of Ornithology 2022). Suitable nesting and foraging habitat is present along the unnamed tidal slough just outside the eastern boundary of the Specific Plan area. This species may nest within the Specific Plan area, or close enough to the Specific Plan area to be affected by the project.
Alameda song sparrow (*Melospiza melodia pusillula*)	CSSC	Nests in salt marsh, primarily in marsh gumplant and cordgrass along channels.	**High (Present as Breeder).** Suitable salt marsh nesting habitat is present in the northern portion of the Specific Plan area. The subspecies is known to breed in the Ravenswood OSP, immediately east of the Specific Plan area, and suitable nesting habitat is present along the unnamed tidal slough east of the Specific Plan area.
Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*)	CSSC	Nests in pickleweed dominant salt marsh and adjacent ruderal habitat.	**High (May be Present as Breeder).** This special-status subspecies was not addressed in the 2012 EIR. In the South San Francisco Bay, Bryant's savannah sparrows nest primarily in short pickleweed-dominated portions of diked/muted tidal salt marsh habitat and in adjacent ruderal habitats (Rottenborn 2007). Suitable nesting habitat occurs in the tidal marshes and immediately adjacent grasslands in the northern portion of the Specific Plan area and in areas adjacent to the eastern boundary of the Specific Plan area in the Ravenswood OSP.

Northern harrier (*Circus hudsonius*)	CSSC (nesting)	Nests in marshes and moist fields with tall vegetation and sufficient moisture to inhibit accessibility of nest sites to predators. Forages over open areas.	**High (May be Present as Breeder).** This species, which is considered special-status only when breeding, was not addressed in the 2012 EIR. Northern harriers occur year-round in the marshes within and adjacent to the Specific Plan area (Cornell Lab of Ornithology, 2022). Suitable nesting habitat is present in the marshes in and adjacent to the eastern portion of the Specific Plan area.
Loggerhead shrike	CSSC (nesting)	Nests in tall shrubs and dense trees; forages in grasslands, marshes, and ruderal habitats.	**Low (Absent as Breeder).** This special-status species was not addressed in the 2012 EIR. Loggerhead shrikes occur occasionally in the Specific Plan area during the winter months, but due to declines in Bay Area breeding populations, they are not expected to nest there (Cornell Lab of Ornithology 2022). The species may, however, forage in grasslands and marshes the Specific Plan area during winter and migration.
Pallid bat (*Antrozous pallidus*)	CSSC	Forages over many habitats; roosts in caves, rock outcrops, buildings, and hollow trees.	**Low (Absent as Breeder).** Historically, pallid bats were likely present in a number of locations throughout the Specific Plan region, but their populations have declined in recent decades, and the species has been extirpated as a breeder from urban areas close to the Bay. Individuals from more remote colonies could potentially forage in the study area in open habitats on rare occasions, but the species is not expected to roost in the Specific Plan area.
Townsend's big-eared bat (*Corynorhinus townsendii*)	CSSC	Roosts in caves and mine tunnels, and occasionally in deep crevices in trees such as redwoods or in abandoned buildings, in a variety of habitats. Forages in edge habitats along streams and adjacent to and in a variety of woodland habitats.	**Low (Absent as Breeder).** This special-status species was not addressed in the 2012 EIR. No known extant populations of the Townsend's big-eared bat occur in the vicinity of the Specific Plan area, and there is a low probability that the species occurs in the Specific Plan vicinity at all due to urbanization. Individuals from more remote colonies could potentially forage in the study area over open habitats on rare occasions, but the species is not expected to roost in the Specific Plan area.
Western red bat Lasiurus blossevillii	CSSC	Roosts in foliage in forest or woodlands, especially in or near riparian habitat.	**Low (Absent as Breeder).** This special-status species was not addressed in the 2012 EIR. Individual western red bats occur in the project vicinity in low numbers as migrants and winter residents, but this species does not breed in the project vicinity. They may roost in the foliage of trees virtually anywhere in the vicinity, but are expected to roost primarily in riparian habitats, which are absent from the Specific Plan area. Occasional individuals may forage over the Specific Plan area year-round.

Salt marsh wandering shrew (*Sorex vagrans halicoetes*)	CSSC	Medium to high marsh 6 to 8 ft above sea level with abundant driftwood and common pickleweed.	**Moderate.** This species is known in the Specific Plan area vicinity from a record at Ravenswood Point, approximately 1 mi north of the Specific Plan area (CNDDB 2022). Suitable pickleweed-dominated salt marsh habitat occurs in the northeastern portion of the Specific Plan area.
State Fully Protected Species			
White-tailed kite (*Elanus leucurus*)	SP	Nests in tall shrubs and trees; forages in grasslands, marshes, and ruderal habitats.	**High (May be Present as Breeder).** This special-status species was not addressed in the 2012 EIR. White-tailed kites are known to nest in eastern San Mateo and Santa Clara Counties throughout the open areas bordering the San Francisco Bay (Sequoia Audubon Society 2001, Cornel Lab of Ornithology 2022). Large trees in and adjacent to the Specific Plan area provide suitable nesting habitat for white-tailed kites, and open areas along the Specific Plan area's urban margin provide foraging habitat for this species.

Key to Abbreviations:

Status: Federally Endangered (FE); Federally Threatened (FT); Federally Proposed (FP); Federal Candidate (FC); State Endangered (SE); State Threatened (ST); State Candidate (SC); State Fully Protected (SP); California Species of Special Concern (CSSC).

5.3 Sensitive Natural Communities, Habitats, and Vegetation Alliances

Sensitive and regulated habitats are rare, ecologically valuable, and/or protected by federal, state, regional, and/or local laws. Generally, such habitats require permits from regulatory agencies if they are to be disturbed, altered, or lost. The CDFW ranks certain rare or threatened plant communities, such as wetlands, tracked in the CNDDB. The most commonly regulated habitats are wetland and aquatic habitats including rivers, streams, ponds, and seasonal wetlands, which fall under the jurisdiction of the USACE via Section 404 of the CWA, the RWQCB via Section 401 of the CWA and the Porter-Cologne Water Quality Control Act, and/or the CDFW via Section 1602 of the California Fish and Game Code.

Natural communities have been considered part of the Natural Heritage Conservation triad, along with plants and animals of conservation significance since the state inception of the Natural Heritage Program in 1979. The CDFW determines the level of rarity and imperilment of vegetation types and tracks sensitive communities in its Rarefind database (CNDDB 2022). Global rankings (G) of natural communities reflect the overall condition (rarity and endangerment) of a habitat throughout its range, whereas state (S) rankings reflect the condition of a habitat within California. Natural communities are defined using NatureServe's standard heritage program methodology as follows (Faber-Langendoen et al. 2012):

G1/S1: Critically imperiled

G2/S2: Imperiled

G3/S3: Vulnerable.

G4/S4: Apparently secure

G5/S4: Secure

In addition to tracking sensitive natural communities, the CDFW also ranks vegetation alliances, defined by repeating patterns of plants across a landscape that reflect climate, soil, water, disturbance, and other environmental factors (Sawyer et al. 2009). If an alliance is marked G1-G3, all of the vegetation associations within it will also be of high priority (CDFW 2022). The CDFW provides the Vegetation Classification and Mapping Program's (VegCAMP) currently accepted list of vegetation alliances and associations (CDFW 2022).

Impacts on CDFW sensitive natural communities, vegetation alliances/associations, or any such community identified in local or regional plans, policies, and regulations, must be considered and evaluated under CEQA (Title 14, Division 6, Chapter 3, Appendix G of the California Code of Regulations). Furthermore, aquatic, wetland and riparian habitats are also protected under applicable federal, state, or local regulations, and are generally subject to regulation, protection, or consideration by the USACE, RWQCB, CDFW, and/or the USFWS.

5.3.1 CDFW Sensitive Habitats

A query of sensitive habitats in the CNDDB (2022) identified two sensitive natural communities as occurring within the nine 7.5-minute USGS quadrangles containing or surrounding the Specific Plan area: (1) northern coastal salt marsh (Rank G3/S3.2 and (2) valley oak woodland (Rank G3/S2.1). Northern coastal salt marsh is characterized by Holland (1986) as occurring along sheltered inland margins of bays, often co-dominated by pickleweed (*Salicornia* spp.), cordgrass, and sometimes saltgrass. This habitat type is present within areas mapped as salt marsh/open water/tidal slough in Figure 4. While individual valley oaks may be present in the Specific Plan area, the valley oak woodland habitat type is absent from the Specific Plan area due to extensive urbanization.

5.3.2 CDFW Sensitive Vegetation Alliances

The tidal marsh habitat present in the Specific Plan area is dominated by pickleweed and would therefore be characterized as *Sarcocornia pacifica* (*Salicornia depressa*) Herbaceous Alliance (Sawyer et al. 2009). This alliance is ranked as G4/S3, meaning that it is globally secure, but considered vulnerable on a state-wide level, and this alliance is included on CDFW's list of sensitive natural communities (as northern coastal salt marsh, discussed above) (CDFW 2022).

5.3.3 CDFW Riparian Habitat

Section 1602 of the Fish and Game Code establishes jurisdiction over the bed, channel, or bank of any river, stream, or lake. CDFW riparian jurisdiction ends at the outer extent of riparian tree or shrub canopy. No rivers, streams, or lakes regulated by CDFW are present in the Specific Plan area. Further, because the tidal sloughs in the Specific Plan area do not receive hydrology from freshwater streams or creeks, they would not be expected to fall under the jurisdiction of CDFW as sensitive riparian habitat.

5.3.4 Sensitive Habitats (Waters of the U.S./State)

As described in Sections 3.1 and 3.2, the salt marsh, open water, and tidal slough habitats found in the northeast and northwest portions of the Specific Plan area (Figure 4), would be considered waters of the U.S. and waters of the state under USACE and RWQCB jurisdiction.

Section 6. Impacts and Mitigation Measures

CEQA and the state CEQA Guidelines provide direction for evaluating impacts of projects on biological resources and determining which impacts will be significant. The Act defines a "significant effect on the environment" as "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." Under state CEQA Guidelines Section 15065, a project's effects on biological resources are deemed significant where the project would:

- "substantially reduce the habitat of a fish or wildlife species"
- "cause a fish or wildlife population to drop below self-sustaining levels"
- "threaten to eliminate a plant or animal community"
- "reduce the number or restrict the range of a rare or endangered plant or animal"

In addition to the Section 15065 criteria that trigger mandatory findings of significance, Appendix G of the State CEQA Guidelines provides a checklist of other potential impacts to consider when analyzing the significance of project effects. The impacts listed in Appendix G may or may not be significant, depending on the level of the impact. For biological resources, these impacts include whether the project would:

A. "have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service"

B. "have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service"

C. "have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling hydrological interruption, or other means)"

D. "interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites"

E. "conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance"

F. "conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan"

Following is an assessment of potential impacts of Specific Plan activities on biological resources. The impact assessment below is structured based on the six significance criteria (A–F) listed above. To the extent that the

impact assessment performed in 2012 is appropriate, we have included relevant text from the 2012 EIR. Where additional detail or discussion is necessary, we have revised or augmented text from the 2012 EIR.

6.1 Impacts on Special-Status Species: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS (Less than Significant with Mitigation)

6.1.1 Impacts on Special-Status Plants (Less than Significant with Mitigation)

As discussed in Section 5.1, suitable habitat and one CNDDB occurrence for Congdon's tarplant are present in the Specific Plan area, but focused surveys for the species within upland habitat located approximately behind the address of 2888 Illinois Street (location of the CNDDB occurrence) found no individuals of the species. Instead, these surveys detected numerous individuals of a similar species in the *Centromadia* genus, common spikeweed. Nevertheless, suitable habitat for this species is present in the Specific Plan area, and it may occur in transitional upland grassland or ruderal/barren habitats in the Specific Plan area. Alkali milk vetch and Point Reyes bird's beak are unlikely to be present, but they have at least a low potential to occur in the tidal marsh habitats in the eastern portions of the Specific Plan area.

Specific Plan activities may affect Congdon's tarplant, alkali milk vetch, and Point Reyes bird's beak due to disturbance or destruction of individuals and suitable habitat. Direct impacts could include grading or filling areas supporting these species, trampling or crushing of plants, and soil compaction. Indirect impacts could include mobilization of dust onto plants, which can affect their photosynthesis and respiration, or changes to hydrology supporting these plants due to grading or construction in nearby habitats. Although shading of special-status plants by new buildings constructed in adjacent areas could adversely affect the health of such plants, it is unlikely that special-status plants will be lost due to shading unless the plants are surrounded on two or more sides by new shading. For example, if special-status plants were to occur in tidal marsh along the eastern edge of the Specific Plan area, and shading occurred only from buildings constructed to the west, these plants are expected to continue to receive enough light to persist without being substantially impacted. Impacts to a very small proportion of the population of these species (10% or less of the population present in the Specific Plan area) would not be considered a significant impact given natural fluctuations in these species' populations and their ability to colonize new, unimpacted habitat. Implementation of Mitigation Measures (MM) BIO-1 through BIO-3 will reduce impacts on special-status plants to a less-than-significant level. These measures have been updated and expanded to provide more detail than presented in the 2012 EIR.

Mitigation Measure BIO-1. Pre-Activity Surveys for Special-Status Plants. Prior to initial ground disturbance for Specific Plan-related projects in salt marsh, tidal slough, and grassland/ruderal habitats, a qualified plant ecologist will conduct an appropriately-timed survey for Congdon's tarplant, Alkali milk vetch, and Point Reyes bird's beak within the project footprint and (as access and visibility allow) a 50-ft buffer around the project footprint. Areas within 50 feet around the project footprint will be surveyed as well as possible using

binoculars and/or by requesting permission from adjacent landowners. This buffer may be increased by the qualified plant ecologist depending on site-specific conditions and activities planned in the areas, but must be at least 50 ft wide (to the extent that access and visibility allow). Situations for which a greater buffer may be required include proximity to proposed activities expected to generate large volumes of dust, such as grading; potential for project activities to alter hydrology supporting habitat for the species; or proximity to proposed structures that may shade areas farther than 50 ft away. Surveys should be conducted in a year with near-average or above-average precipitation; surveys conducted in a year of below-average rainfall would be considered valid if examination of reference populations of the target species indicate that the species would be detectable if present. The purpose of the survey will be to assess the presence or absence of special-status plants, including Congdon's tarplant, alkali milk vetch, and Point Reyes bird's beak. If the target species are not found in the impact area or the identified buffer, then no further mitigation will be warranted. If the target species, or any other special-status plants are found in the impact area or identified buffers, then MM BIO-2 and BIO-3 will be implemented.

Mitigation Measure BIO-2. Special-Status Plant Avoidance Buffers. To the extent feasible, and in consultation with a qualified plant ecologist, the project proponent will design and construct the proposed project to completely avoid impacts on all populations of special-status plants within the project footprints or within the identified buffers of the impact areas. Avoided special-status plant populations will be protected by establishing and observing the identified buffer between plant populations and the impact area. All such populations located in the impact area or the identified buffer, and their associated designated avoidance areas, will be clearly depicted on any construction plans. In addition, prior to initial ground disturbance or vegetation removal, the limits of the identified buffer around special-status plants to be avoided will be marked in the field (e.g., with flagging, fencing, paint, or other means appropriate for the site in question). This marking will be maintained intact and in good condition throughout project-related construction activities.

If complete avoidance is not feasible and more than 10% of a population (by occupied area or individuals) would be impacted as determined by a qualified plant ecologist, MM BIO-3 will be implemented.

Mitigation Measure BIO-3. Preserve and Manage Mitigation Populations of Special-Status Plants. If avoidance of special-status plants is not feasible and more than 10% of the population would be impacted, compensatory mitigation will be provided via the preservation, enhancement, and management of occupied habitat for the species, or the creation and management of a new population. To compensate for impacts on special-status plants, habitat occupied by the affected species will be preserved and managed in perpetuity at a minimum 1:1 mitigation ratio (at least one plant preserved for each plant impacted, and at least one occupied ac preserved for each occupied ac affected), for any impact over the 10% significance threshold. Alternately, seed from the population to be impacted may be harvested and used either to expand an existing population (by a similar number/occupied area to compensate for impacts to special-status plants beyond the 10% significance threshold) or establish an entirely new population in suitable habitat.

Areas proposed to be preserved as compensatory mitigation for impacts to special-status plants must contain verified extant populations of the species, or in the event that enhancement of existing populations or

establishment of a new population is selected, the area must contain suitable habitat for the species as identified by a qualified plant ecologist. Mitigation areas will be managed in perpetuity to encourage persistence and even expansion of this species. Mitigation lands cannot be located on land that is currently held publicly for resource protection unless substantial enhancement of habitat quality will be achieved by the mitigation activities. The mitigation habitat will be of equal or greater habitat quality compared to the impacted areas, as determined by a qualified plant ecologist, in terms of soil features, extent of disturbance, vegetation structure, and dominant species composition, and will contain at least as many individuals of the species as are impacted by project activities. The permanent protection and management of mitigation lands will be ensured through an appropriate mechanism, such as a conservation easement or fee title purchase.

A habitat mitigation and monitoring plan (HMMP) will be developed and implemented for the mitigation lands. That plan will include, at a minimum, the following information:

- a summary of habitat impacts and the proposed mitigation;
- a description of the location and boundaries of the mitigation site and description of existing site conditions;
- a description of measures to be undertaken to enhance (e.g., through focused management that may include removal of invasive species in adjacent suitable but currently unoccupied habitat) the mitigation site for the species;
- a description of measures to transplant individual plants or seeds from the impact area to the mitigation site, if appropriate (which will be determined by a qualified plant or restoration ecologist), as well as a requirement that any salvaging or transplanting of plants occur in accordance with appropriate best management practices for minimizing the spread of plant pathogens (https://www.suddenoakdeath.org/welcome-to-calphytos-org-phytophthoras-in-native-habitats/resources/);
- proposed management activities to maintain high-quality habitat conditions for the species;
- a description of habitat and species monitoring measures on the mitigation site, including specific, objective final and performance criteria, monitoring methods, data analysis, reporting requirements, monitoring schedule, etc. At a minimum, performance criteria will include demonstration that any plant population fluctuations over the monitoring period of a minimum of 5 years for preserved populations and a minimum of 10 years for enhanced or established populations do not indicate a downward trajectory in terms of reduction in numbers and/or occupied area for the preserved mitigation population that can be attributed to management (i.e., that are not the result of local weather patterns, as determined by monitoring of a nearby reference population, or other factors unrelated to management); and
- contingency measures for mitigation elements that do not meet performance criteria.

The HMMP will be prepared by a qualified plant or restoration ecologist. Approval of the HMMP by the City, and by the USFWS or CDFW if the impacted plant species is listed under the Federal or California Endangered Species Act, respectively, shall be required before project impacts to this species occur.

6.1.2 Impacts on the Monarch Butterfly and Crotch's Bumble Bee (Less than Significant)

The monarch butterfly (a federal candidate species) and Crotch's bumble bee (a state candidate species) were not addressed in the 2012 EIR, as they were not considered special-status species at the time.

The monarch butterfly occurs in the project region primarily as a migrant, and no current or historical overwintering sites are known in the Specific Plan area, so no large nonbreeding aggregations would occur in the Specific Plan area. Further, larval host plants (*Asclepias* spp.) were not observed within any of the undeveloped habitats of the Specific Plan area during the July 2022 reconnaissance surveys. If larval host plants are present in areas of proposed future development at all, they are very scarce.

Until recently, monarch butterflies were not known to breed in the Bay Area during the winter months, and would normally be expected to be present during winter only in coastal nonbreeding overwintering aggregations. James et al. (2021), however, documented breeding in several locations in the Specific Plan region (i.e. at the Rinconada Community Garden in Palo Alto) during the winter of 2020-2021. This breeding was facilitated by the use of nonnative, tropical milkweeds in landscape vegetation. Due to irrigation, these milkweeds persist during the winter months when native milkweeds in more natural, non-irrigated settings die back and are unavailable for oviposition. The implications of winter breeding by monarchs in the Specific Plan area are complex, and not fully understood. Nevertheless, because landscape vegetation in the Specific Plan area may include nonnative, tropical milkweeds, isolated breeding could occur in the Specific Plan area at any time of year. However, any individuals that breed in irrigated landscapes are not expected to be impacted by independent projects, as these likely occur primarily in residential gardens or other small landscape installations.

Native milkweeds are scarce in the Specific Plan area, and therefore, the loss of suitable habitat or larval hostplants would not result in a substantial impact to the regional availability of such habitat, hostplants, or monarch butterfly populations. Similarly, if any host plants containing monarch butterfly eggs, larvae, or pupae were to be impacted, they would represent such a small proportion of the regional population of monarchs that such impacts would not result in a substantial reduction in regional populations of monarchs. For these reasons, impacts on the monarch butterfly would be less than significant under CEQA.

Crotch's bumble bee is not known to occur in the Specific Plan area. Although it has been recorded in one location at the Palo Alto Baylands 1.7 mi to the southeast of the Specific Plan area (Bumble Bee Watch 2023, iNaturalist 2023), the next nearest recent occurrence was 4.7 miles from the Specific Plan area. Habitat quality in the Specific Plan area is low due to the absence of extensive, high-quality floral resources and the developed or wetland nature of most of the area, thus minimizing potential for nesting. Therefore, there is a low probability that the species breeds in the Specific Plan area, and if it does so, it would breed only in very low numbers. More likely, the species occurs only as a forager (e.g., possibly foraging on flowers along the eastern edge of the Specific Plan area) if it is present at all. In the unlikely event that any individuals were impacted by Specific Plan activities, they would represent such a small proportion of the regional population that such impacts would not result in a substantial reduction in regional populations of the species. For these reasons, impacts on the Crotch's bumble bee would be less than significant under CEQA.

6.1.3 Impacts on the Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew (Less than Significant with Mitigation)

As discussed in Chapter 4.4 of the 2012 EIR, the Specific Plan area contains suitable pickleweed habitat to support salt marsh harvest mouse and salt marsh wandering shrew populations. Specific Plan activities could result in impacts on these species due to loss of individuals or suitable habitat, which, due to the rarity of these species, would constitute a significant impact. The following impact discussion and mitigation measures have been updated and expanded to provide more detail than presented in the 2012 EIR.

Since the certification of the 2012 EIR, our understanding of habitat use by salt marsh harvest mice has changed somewhat. While the salt marsh harvest mouse has been widely regarded as being restricted to pickleweed-dominated marshes of the San Francisco Bay, recent radio-tracking has demonstrated that the species also uses brackish marshes, nontidal managed wetlands, and some adjacent upland habitats as well (Smith 2019). The species also has a much broader diet than the pickleweed-focused diet previously assumed. When presented a variety of foods that were seasonally abundant, the diet of the salt marsh harvest mouse comprised 45 native and nonnative plant species along with a few invertebrates, with the two most commonly chosen plants being the nonnative rabbits foot grass (*Polypogon monspeliensis*) and fat hen (*Atriplex prostrata*) (Smith 2019). Thus, impacts to salt marsh harvest mice can occur not only if project activities occur in pickleweed dominated habitats, but also if those activities occur in immediately adjacent uplands providing suitable food sources.

Because salt marsh harvest mice are known to occur in tidal marshes adjacent to the Specific Plan area, and suitable habitat is present in the Specific Plan area in tidal marshes in the Specific Plan area as well, individuals may be present in tidal marsh habitats on project sites. In addition, small numbers of foraging salt marsh harvest mice, as well as individuals taking refuge during high tides, may be present in ruderal grasslands immediately adjacent to tidal marshes within project sites. Although the distribution and habitat associations of the salt marsh wandering shrew are poorly known, it is assumed that this species could potentially be present in the same areas used by salt marsh harvest mice.

In the absence of protective measures, direct impacts on the salt marsh harvest mouse and/or salt marsh wandering shrew could potentially occur as a result of grading and construction activities within these areas. Project activities may result in the injury or mortality of these species as a result of crushing by equipment, vehicle traffic, and worker foot traffic. Individuals that vacate an area because of increased levels of noise and disturbance may be exposed to increased competition from conspecifics already occupying the area to which they were displaced and increased levels of predation because of unfamiliarity with the new area or lack of sufficient cover. Project construction and the removal of salt marsh vegetation or immediately adjacent upland vegetation may also expose individual mice or shrews to predation, particularly if construction activities occur during king tides, when cover for these species is very limited.

Indirect impacts on habitat for the salt marsh harvest mouse and salt marsh wandering shrew may occur during the construction and post-construction phases of projects due to sediment runoff into adjacent marsh habitat. Adverse construction-phase impacts could occur as a result of run-off carrying sediment or pollutants into the marshes that could degrade water quality in aquatic and wetland habitats immediately adjacent to the site.

However, such impacts will be avoided and minimized through compliance with the NPDES Construction General Permit, project stormwater pollution prevention plans (SWPPP), and the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (MRP) (See section 6.2.1 for further discussion of these permits). With implementation of measures required for compliance with the NPDES Construction General Permit, SWPPP, and MRP, project impacts on the salt marsh harvest mouse and salt marsh wandering shrew due to degradation of water quality are less than significant.

Human food waste attracts and subsidizes the diets of certain urban-adapted "nuisance species", such as the native American crow (*Corvus brachyrhynchos*) and raccoon and the nonnative Norway rat and black rat. These species are also predators of more sensitive native species, including the salt marsh harvest mouse and salt marsh wandering shrew. Increases in human food waste that is available to these nuisance species, which could potentially result from increased land uses and numbers of people on the Project site, may augment populations of nuisance species and exacerbate predation on sensitive species. In addition, human food waste at project sites could attract such predators to the site, and thus into areas in close proximity to salt marsh harvest mouse and salt marsh wandering shrew populations. Due to the rarity of these mammals, all these effects would result in a significant impact.

In the absence of protective measures, projects could impact the salt marsh harvest mouse and salt marsh wandering shrew by increasing the abundance and quality of hunting perches for avian predators such as common ravens (*Corvus corax*) and red-tailed hawks as new buildings, taller buildings, and associated landscaping are added; such features could provide perches from which avian predators could hunt small mammals and birds associated with the marsh habitats on and adjacent to the Specific Plan area. Although PG&E towers in the Ravenswood OSP marsh and other structures in the vicinity already provide predator perches, the new buildings would introduce more high perches, and in new areas, thus potentially increasing risk of predation of salt marsh harvest mice and salt marsh wandering shrews. Given the rarity of these species, any increase in predation as a result of the creation of raptor perches would be a significant impact.

Shading of salt marsh harvest mouse and salt marsh wandering shrew habitat by new buildings constructed in adjacent areas could adversely affect the health of vegetation. However, it is unlikely that such shading will result in a substantial impact to these species' habitats. These mammals are associated with tidal marsh along the eastern edge of the Specific Plan area. Even if new buildings are constructed to the west, tidal marsh plants would still receive ample sunlight during much of the day that tidal marsh habitats would not be impacted substantially. In addition, increases in nighttime lighting resulting from the installation of new or higher-intensity lighting could impact these species by altering their behavior, causing them to avoid otherwise suitable habitat, or making these species more susceptible to predation (see Section 6.1.10 for more discussion of lighting impacts).

As described above in Section 1.1, a new Loop Road has been proposed to connect University Avenue to the terminus end of Demeter Street. The Loop Road would wrap around the northern and eastern perimeter of University Village (which is excluded from the Specific Plan area). Two configurations of the Loop Road are under consideration: one with minimal or no vehicle lanes, and one with an expanded two-lane "Loop Road"

inserted. These two configurations are illustrated in Figure 3. Below we describe the proposed configurations of the Loop Road and the direct loss of habitat that would result from the construction of the road for both the salt marsh harvest mouse and salt marsh wandering shrew. Table 2 summarizes the impacted habitat acreages for each configuration. All direct and indirect impacts to both species, as described above, may occur during the construction and post-construction of the Loop Road due to the close proximity of the Loop Road to potential habitat for these species.

No Loop Road Configuration

The "No Loop Road" configuration would have only a shared multiuse path for bicycles/pedestrians and the currently existing service lane with access for San Francisco Public Utilities Commission (SFPUC) infrastructure, located north of the Specific Plan area. The northern perimeter would be constructed within a 50-ft right-of-way between existing property lines of University Village residences (to the south) and into upland grassland and salt marsh habitats (to the north). The eastern perimeter configuration would consist simply of a 30-ft right-of-way area between the property lines of University Village residences (to the west) and salt marsh and upland grassland habitats (to the east). This would accommodate a shared multiuse trail for bicycles/pedestrians (on top of the proposed levee) and no travel lanes (i.e., no Loop Road). Cars, buses, trucks, and large shuttles would not be allowed in this configuration. In this configuration, construction would result in the direct loss of 1.17 ac of upland grassland and 0.69 ac of salt marsh habitats that may be used by both salt marsh harvest mice and salt marsh wandering shrews, as well as 1.90 ac of urban landscape that would not provide suitable habitat for these species.

With Loop Road Configuration

The "Loop Road" configuration would extend the right-of-way to 76 ft in the northern perimeter and 56 ft in the eastern perimeter and would include two travel lanes, along with a multiuse path and associated shoulders and buffers. This would result in the direct loss of 2.72 ac of upland grassland and 1.72 ac of salt marsh that provides potential habitat for salt marsh harvest mice and salt marsh wandering shrews, as well as 2.08 ac of urban landscape that would not provide suitable habitat for these species.

In both configurations, the construction of a flood-risk management levee structure, as part of the SAFER Bay project, is being considered, with a multiuse path constructed on top of the levee as shown in Figure 3. However, we are only reporting the direct loss of habitat acreage from the proposed construction of a multi-use path with and without the Loop Road – and not the construction of the levee – given that the levee would not be considered as part of the Specific Plan, and its construction would be analyzed separately. Habitat acreage impacts from the both proposed configurations are summarized in Table 2 and illustrated in Figure 7.

Figure 7. Proposed Loop Road Configuration Impact Areas

Table 2. Habitat Acreage Impacts from Construction with No Loop Road and With Loop Road (Proposed Configurations)

Proposed Configuration	Habitat	Impacted Acres
No Loop Road	Urban Landscape	1.90
	Upland: Nonnative Grassland / Ruderal	1.17
	Salt marsh, Open Water / Tidal Slough	0.69
With Loop Road	Urban Landscape	2.08
	Upland: Nonnative Grassland / Ruderal	2.72
	Salt marsh, Open Water / Tidal Slough	1.72

It is unknown at this time whether the proposed Loop Road (or multi-use paths) would be constructed prior to, after, or concurrently with the proposed levee. If the Loop Road is built after or concurrently with the construction of the levee, and it is located on the inward side of the levee, we would not expect the Loop Road to have any impacts on the habitat of these species, given that the levee construction itself would impact these habitats. The levee construction would not be considered as part of the Specific Plan and would be analyzed separately in its impact on jurisdictional salt marsh habitat. However, if the Loop Road is built prior to the construction of the levee, or there is no levee that is built, then the impacts as described here and below from the construction of the Loop Road would need to be considered.

Implementation of MM BIO-4 through BIO-11 will reduce impacts on salt marsh harvest mice and salt marsh wandering shrews to less-than-significant levels. These measures have been updated and expanded to provide more detail than presented in the 2012 EIR.

Mitigation Measure BIO-4. Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew Minimization Measures. Any development project within 100 ft of an area identified as salt marsh, open water, or tidal slough in Figure 4 shall be subject to a habitat assessment prepared by a qualified biologist. All habitats identified by the biologist as suitable habitat for the salt marsh harvest mouse or salt marsh wandering shrew shall be avoided for development and preserved in their existing state to the extent feasible. If avoidance of salt marsh habitats is infeasible, the following measures shall be implemented.

- Before any construction activities begin, a qualified biologist will conduct a training session for all construction personnel. At a minimum, the training will include descriptions of the salt marsh harvest mouse and salt marsh wandering shrew, their habitats, the laws protecting them, the general measures that are being implemented to conserve these species as they relate to the project, and the boundaries within which the project may be accomplished.
- To avoid the loss of individual harvest mice or shrews from any excavation, fill, or construction activities in suitable habitat, vegetation removal will be limited to the minimum amount necessary to permit the activity to occur. Wherever feasible, sufficient suitable habitat, as determined by a qualified biologist, will remain adjacent to the activity area to provide refugia for displaced individuals.

- Within areas where vegetation potentially supporting salt marsh harvest mice or salt marsh wandering shrews will be impacted, vegetation and debris that could provide cover for mice will be removed using only hand tools (which may include motorized equipment such as line trimmers if the vegetation removed is inspected by a qualified biologist and does not contain any salt marsh harvest mice or salt marsh wandering shrews) at least one week prior to the commencement of construction activities. Vegetation removal will occur under the supervision of a qualified biologist. This vegetation will be removed on a progressive basis, such that the advancing front of vegetation removal moves toward vegetation that would not be disturbed. If necessary, temporary shelter consisting of dead vegetation may be positioned to provide escape routes to suitable habitat. A qualified biologist will monitor the vegetation removal and make specific recommendations with respect to the rate of vegetation removal (to ensure that any harvest mice or shrews present are able to escape to cover that will not be impacted), and whether vegetation needs to remain in a certain area temporarily to facilitate dispersal of mice into habitat outside the impact area.
- All cut vegetation, except cut vegetation left in place as escape cover, will be removed daily from vegetation removal areas to prevent it from being used as refugia by salt marsh harvest mice
- If a salt marsh harvest mouse or salt marsh wandering shrew, or an animal that may be a salt marsh harvest mouse or salt marsh wandering shrew, is detected during vegetation removal or other project activities, all work that could impact the individual will cease until the animal has moved out of the impact area on its own. A qualified biologist will monitor the animal to ensure that it disperses out of the impact area. If the animal will not move on its own, the biologist will confer with the USFWS and CDFW to identify appropriate measures to avoid impacts to the animal. No salt marsh harvest mice or salt marsh wandering shrews will be handled (even for relocation) without prior approval from the USFWS and CDFW.
- Following the hand-removal of vegetation, exclusion fencing will be erected as needed between construction areas and harvest mouse/shrew habitat that is to remain unimpacted to define and isolate protected harvest mouse/shrew habitat. This fencing will consist of material that cannot be climbed by harvest mice, buried at least 4 inches below the ground's surface, and with at least 1 ft (but no more than 4 ft) above the ground. All supports for the fencing will be placed on the inside of the work area. A minimum 2-ft buffer will be maintained free of vegetation around the outside of the exclusion fencing. The fencing will be inspected daily during construction, and any necessary repairs will be made within 24 hours of when they are found. If any breaks in the fencing are found, the qualified biologist will inspect the work area for salt marsh harvest mice and salt marsh wandering shrews.
- During construction, a qualified biologist will be on-call to check underneath vehicles and equipment for salt marsh harvest mice and salt marsh wandering shrews before such equipment is moved, unless the equipment is surrounded by harvest mouse exclusion fencing.
- No animals (e.g., dogs or cats) will be brought to the project site by project personnel to avoid harassment, killing, or injuring of wildlife.

- The project site will be maintained trash-free, and food refuse will be contained in secure bins and removed daily during construction, to avoid attracting nuisance animals that may then prey on salt marsh harvest mice.
- Nighttime work will be avoided if feasible. If avoidance of night work is infeasible, all project lighting will be shielded and directed away from tidal marshes.
- Construction activities within 10 ft of the high tide line will not occur within two hours before or after extreme high tides (6.5 ft or above, as measured at the Golden Gate Bridge and adjusted to the timing of local high tides), when the marsh plain is inundated, because protective cover for these species is limited and activities could prevent them from reaching available cover.
- In either configuration, with or without the Loop Road, salt marsh and upland grassland habitats, which may be used for foraging and high-tide refugia by both species, would be located immediately adjacent to the new road and pathways. Therefore, dense upland ecotone/transitional salt marsh vegetation will be planted along the immediate edge of the shoulder of the Loop Road adjacent to salt marsh and upland grassland habitats to provide high-tide refugia for both species.
- In order to provide a barrier between transitional salt marsh and upland grassland habitats and the newly constructed Loop Road, and to discourage Loop Road/multiuse path users from entering potential habitats used by salt marsh harvest mice and salt marsh wandering shrews, a low (<3 ft tall) symbolic fence or wall with educational signs prohibiting entry will be placed along the edge of the developed area, between the developed area and the upland ecotone to be added as described above.

Mitigation Measure BIO-5. Salt Marsh Harvest Mouse and Salt Marsh Wandering Shrew Compensatory Mitigation. Compensatory mitigation for individual project impacts on the salt marsh harvest mouse and salt marsh wandering shrew habitat will be provided via the purchase of credits from a conservation bank or mitigation bank that has restored suitable salt marsh habitat for these species; project-specific mitigation via the preservation and management of suitable habitat for this species; or some combination of the two approaches. If no USFWS/CDFW-approved conservation banks specifically for these mammals are available, credits in a tidal wetland mitigation bank that provides suitable habitat for, and is expected to be occupied by, these species would be adequate. Compensatory mitigation shall be provided at a minimum ratio of 2:1 (mitigation:impact) on an acreage basis if project-specific mitigation is performed or 1:1 if credits are purchased from a mitigation or conservation bank. Compensatory mitigation shall be provided for any potentially suitable habitat for these species that is permanently lost to development or that is present within 50 ft of any new or higher-intensity lighting installed by Specific Plan activities.

If project-specific mitigation is provided as compensatory mitigation, the applicant will prepare an HMMP describing the measures that will be taken to create, restore, or enhance habitat for the salt marsh harvest mouse and salt marsh wandering shrew and monitor the effects of the mitigation on these species. The HMMP will include, at a minimum, the following:

- A summary of project impacts on the salt marsh harvest mouse and salt marsh wandering shrew and the proposed mitigation of these impacts;
- A description of the location and boundaries of the mitigation site and a description of existing mitigation site conditions;
- A description of measures to be undertaken, if necessary, to enhance (e.g., through focused management) the mitigation site for the salt marsh harvest mouse and salt marsh wandering shrew;
- Proposed management activities, such as management of invasive plants, to maintain high-quality habitat conditions for the focal species;
- A description of community and species monitoring measures on the mitigation site, including specific, objective goals and objectives, performance indicators, success criteria, monitoring methods, data analysis, reporting requirements, and monitoring schedule. At a minimum, success criteria will include demonstration that habitat conditions are suitable for occupancy by the salt marsh harvest mouse and salt marsh wandering shrew, and that either (a) at least one of these species is present, or (b) the site is connected to pre-existing, suitable, and presumably occupied habitat so that colonization of the mitigation site is determined to be likely by a qualified biologist. Monitoring will occur until these criteria are achieved but for no less than 5 years;
- A description of the HMMP's adaptive component, including potential contingency measures for mitigation elements that do not meet performance criteria; and
- A description of the funding mechanism to ensure the long-term maintenance and monitoring of the mitigation lands.

The HMMP will be submitted to the USFWS and CDFW for review and approval prior to implementation.

Mitigation Measure BIO-6. Prohibit Rodenticides. Use of rodenticides shall not be allowed by the City within 100 ft of any salt marsh habitat.

Mitigation Measure BIO-7. Restrict Pesticide Use in and near Salt Marsh Habitats. All pesticides used within 300 ft of salt marsh habitats must be utilized in accordance with the manufacturer's directions, and pesticides shall not be stored, loaded, or mixed within 300 feet of any salt marsh or open water/tidal slough habitat unless the user's property is located entirely within 300 feet of those habitats (in which case off-site storage may be infeasible). No pesticides shall be applied within tidal marsh habitats as part of Specific Plan activities. Any pesticides used in areas where they could be washed, or could drift via wind, into tidal marsh habitat must be approved by the EPA for use in aquatic habitats.

Mitigation Measure BIO-8. Raptor Perch Deterrents. Within 300 ft of any salt marsh habitats within or adjacent to the Specific Plan area, raptor perch deterrents will be placed on any edges of building roofs, terraces, or other structures (e.g., light poles or electrical towers) that are high enough to overlook the marsh and that have an unobstructed view to the marsh. The specific type of perch deterrent(s) used will be approved by a

qualified biologist and the City but shall not include flagging or other wind-activated materials, or any deterrents that include lights.

Mitigation Measure BIO-9. Landscape Design. To avoid perches for avian predators and dense woody vegetation that could hide mammalian predators of salt marsh harvest mouse and salt marsh wandering shrew, new landscaping, as well as the size, location and species of any new or replacement public street trees, within 300 ft of salt marsh habitats shall be reviewed and approved by a qualified biologist familiar with these species' ecology to ensure that no new landscaping poses a threat to these two mammals. Intervening structures, topography, and other features that may block the view of the tidal marsh from avian predators using proposed trees will be considered by the biologist.

Mitigation Measure BIO-10. Restrictions on Outdoor Cat Feeding Stations and Off-Leash Dogs. Outdoor cat feeding stations will be prohibited within 300 ft of salt marsh habitats. Off-leash dogs will be prohibited within 100 ft of salt marsh habitats unless within fenced areas.

Mitigation Measure BIO-11. Food Waste Management. The following measures shall be implemented within 100 ft of salt marsh habitats to minimize impacts on salt marsh harvest mice and salt marsh wandering shrews due to the attraction of nuisance predators.

- Any bins used for food waste shall include lids that seal tightly to prevent access by animals and incorporate a mechanism to prevent them from being inadvertently left open when not in active use.
- Outdoor trash and recycling receptacles shall be emptied frequently enough that cans do not fill up and allow food waste to spill out. Any observations of over-flowing or non-functioning trash bins should be reported to those responsible for emptying the bins, and to the City, to ensure that they are emptied when necessary.
- Litter on the site shall be picked up daily, and no food trash is left on-site overnight.
- Signs shall be placed on trash and recycling receptacles reminding users to close the lids so that they will not be inadvertently left open.
- Residents and visitors shall be prohibited from feeding feral or wild mammals.
- Educational signs shall be posted explaining the importance and sensitivity of nearby marsh habitats, prohibiting feeding wildlife and feral animals on the property, prohibiting off-leash dogs, and advising residents and visitors to dispose of food waste in outdoor areas appropriately to avoid attracting and subsidizing nuisance species.

6.1.4 Impacts on the California Black Rail and California Ridgway's Rail (Less than Significant with Mitigation)

As discussed in Chapter 4.4 of the 2012 EIR, the Specific Plan area contains suitable nesting habitat for the California black rail and California Ridgway's rail, and future development that results in impacts on habitat,

individuals, or breeding success of these species would be a significant impact. The following impact discussion and mitigation measures have been updated and expanded to provide more detail than presented in the 2012 EIR.

Suitable breeding habitat for the California black rail and California Ridgway's rail is present within the Specific Plan area in the salt marsh habitats in the northeast portion of the Specific Plan area and immediately adjacent to the entire eastern margin of the Specific Plan area. Direct and indirect impacts to these species' habitats are similar to those described in Section 6.1.3 for the salt marsh harvest mouse and salt marsh wandering shrew. For example, in the absence of protective measures, Specific Plan activities (including the construction of the Loop Road) could impact the California Ridgway's rail and California black rail by attracting predators due to increased human food availability, increasing the abundance and quality of hunting perches for avian predators such as common ravens and red-tailed hawks, and increasing nighttime lighting of these species' habitat. Direct loss of tidal salt marsh (including upland transitional habitat that provides refugia for rails during high tides) would constitute a loss of suitable habitat for these species. Implementation of MM BIO-4 through BIO-11, described in section 6.1.3 above, with California black rail and California Ridgway's rail incorporated into the worker training program described in MM BIO-4 and in the compensatory mitigation described in MM BIO-5, will reduce these impacts to less-than-significant levels.

If pairs of the California black rail and/or California Ridgway's rail are nesting in or close enough to the Specific Plan area when independent project construction occurs, heavy ground disturbance, noise, and vibrations caused by construction of independent projects could potentially result in the abandonment of nests, and possibly the loss of eggs or young as a result. The 2012 EIR considered implementation of its MM BIO-3a, which includes preconstruction surveys, the establishment of buffers around active nests, and a worker education program about sensitive species, to be sufficient to reduce these impacts to a less-than-significant level. However, due to the difficulty in detecting active rail nests and the disturbance caused by preconstruction nest surveys during the breeding season, it is our opinion that alternative measures (described in MM BIO-12) are more appropriate to reduce potential impacts on the California Ridgway's rail and California black rail to less-than-significant levels.

Mitigation Measure BIO-12. Seasonal Avoidance or Protocol-level Surveys and Buffers around Calling Centers. To avoid causing the abandonment of an active California Ridgway's rail or California black rail nest, independent project activities within 700 ft of salt marsh habitats within or adjacent to the Specific Plan area will be avoided during the rail breeding season (from February 1 through August 31) unless (a) a qualified biologist in coordination with USFWS and CDFW determines that a reduced buffer (but no less than 200 ft) is appropriate due to intervening development or obstructions, the level of disturbance by the activity (in terms of noise and equipment), or other factors that would reduce the potential for the activity to disturb nesting rails, or (2) protocol-level surveys are conducted by a qualified biologist to determine rail locations and territories during the year in which construction is initiated. Protocol-level surveys are typically initiated in late January, so proactive planning is necessary to ensure that such surveys are conducted according to the protocol during the year in which construction occurs. If breeding rails are determined to be present, construction activities will not occur within 700 ft of an identified California Ridgway's rail calling center, or within 300 ft of

a California black rail calling center, during the breeding season unless the USFWS and CDFW provide guidance regarding the types of activities that may occur within lesser distances from calling centers, in which case USFWS and CDFW guidance shall be followed.

6.1.5 Impacts on Special-Status Fish, Designated Critical Habitat, and Essential Fish Habitat (Less than Significant with Mitigation)

The 2012 EIR assessed impacts to wetland habitats but did not explicitly evaluate impacts to fish. Special-status fish, including green sturgeon, Central California Coast steelhead, and longfin smelt may occasionally occur immediately adjacent to the Specific Plan area in an unnamed tidal slough adjacent to the eastern portion of the Specific Plan area. This tidal slough has been included within NMFS's San Francisco Bay-wide critical habitat designation for green sturgeon and Central California Coast steelhead. In addition, the tidal slough provides EFH for a variety of FMP-managed fish species.

If activities under the Specific Plan were to occur in or near tidal salt marsh, open water, or tidal slough habitats, those activities could potentially impact special-status fish, designated critical habitat, and EFH. In-water work could result in fish stranding if fish are trapped in excavated areas or within coffer dams around work areas; reduction in water quality could occur due to mobilization of sediments or contaminants (e.g., leaks from construction equipment) during construction; and there is some potential for loss of a limited area of fish habitat. Construction may result in indirect adverse effects on fish and their habitats due to short-term increases in suspended sediment and turbidity near the project site as a result of run-off and potential leaking or spills of chemical contaminants or hazardous materials (gasoline, oil, grease, concrete) onto the ground from use of heavy equipment adjacent to aquatic habitats. Increased suspended sediment and turbidity may have direct effects on special-status fish and FMP-managed species by interfering with visual foraging, interfering with migratory behavior, and injuring gills. Indirect effects could include increasing susceptibility to predation and reducing availability of food. Leaking or spills of chemical contaminants or hazardous materials could be toxic to special-status fish, FMP-managed species, and their prey. Due to the regional rarity of special-status fish and the ecological importance of EFH and FMP-managed fish species, such impacts would be significant under CEQA in the absence of recommended measures to avoid or minimize impacts.

As described in Section 3.2.6, the project will comply with the requirements of the NPDES Statewide Storm Water Permit and Statewide General Construction Permit. Collectively, these requirements are likely to reduce the project's impacts on water quality in aquatic habitats in and adjacent to the Specific Plan area. In addition, implementation of mitigation measures BIO-13 through BIO-15 will reduce impacts on fish and their habitats to less-than-significant levels.

Mitigation Measure BIO-13. Worker Environmental Awareness Training. Personnel working on projects within or adjacent to salt marsh, open water, or tidal slough habitats shall be trained by a qualified biologist in the importance of the marine environment to special-status fish and other aquatic animals and plants, and the environmental protection measures put in place to prevent impacts to these species, their habitats, and EFH. This training session will include the information described in MM BIO-4, as well as the following.

- A review of the special-status fish, other aquatic animals and plants, and sensitive habitats that could be found in or near the work areas
- Measures to avoid and minimize adverse effects to special-status fish, other aquatic animals and plants, their habitats, and EFH
- A review of all conditions and requirements of environmental permits, reports, and plans (e.g., USACE permits)

Mitigation Measure BIO-14. Water Quality Protection. During construction, the project shall employ standard construction BMPs to protect water quality. These BMPs may include but are not limited to the following:

- Sediment mitigation measures shall be in place prior to the onset of project construction and shall be monitored and maintained until construction activities have been completed. Temporary stockpiling of excavated or imported material shall occur only in approved construction staging areas. Stockpiles that are to remain on the site throughout the wet season shall be protected to prevent erosion.
- No litter, debris, or sediment shall be dumped into storm drains. Daily trash and debris removal shall occur at the site.
- All litter and construction debris shall be disposed of off-site in accordance with state and local regulations. All trash and debris within the work area shall be placed in containers with secure lids before the end of work each day in order to reduce the likelihood of predators being attracted to the site by discarded food wrappers and other rubbish that may be left on-site. If containers meeting these criteria are not available, all rubbish shall be removed from the project site at the end of each work day.
- Equipment staging and parking of vehicles shall occur on established access roads and flat surfaces.
- The integrity and effectiveness of construction fencing and erosion control measures shall be inspected on a daily basis. Corrective actions and repairs shall be carried out immediately for fence breaches and ineffective BMPs.
- Fueling, washing, and maintenance of vehicles shall occur in developed habitat, away from all tidal salt marsh, open water, and tidal slough habitats. Equipment shall be regularly maintained to avoid fluid leaks. Any leaks shall be captured in containers until equipment is moved to a repair location. Hazardous materials shall be stored only within the developed habitat. Containment and cleanup plans shall be prepared and put in place for immediate cleanup of fluid or hazardous materials spills.
- Absorbent materials designated for spill containment and clean-up activities shall be available on project sites for use in an accidental spill.
- At no time shall sediment-laden water be allowed to enter the salt marsh, open water, or tidal slough habitats.

Mitigation Measure BIO-15. Dewatering Plan and In-Water Work Windows. No in-water work will occur in the open water or tidal slough habitats within the Specific Plan area unless a dewatering plan is prepared and approved by the City. This plan will describe measures implemented to ensure that fish are excluded from the work area prior to dewatering. Any in-water work shall be conducted between June 1 through November 30 to avoid the periods when special-status fish have the greatest potential to occur in the Specific Plan area. If completion of in-water work within this period is not feasible due to scheduling issues, timing guidelines shall be established and approved by NMFS prior to initiation of in-water work.

6.1.6 Impacts on Burrowing Owl (Less than Significant with Mitigation)

The 2012 EIR considered impacts on burrowing owls to be significant and described mitigation measures for the species. The following impact discussion and mitigation measures have been updated and expanded to provide more detail than presented in the 2012 EIR.

As discussed in section 5.2 of this assessment, the burrowing owl (a California species of special concern) is not known or expected to nest in or very close to the Specific Plan area, but it may occur as a wintering resident or migrant, and nonbreeding individuals could potentially forage and roost in the Specific Plan area in small numbers. The Specific Plan area does not provide high-quality habitat for this species due to the lack of extensive undisturbed grassland habitat, the close proximity of development to the small areas of grassland and ruderal habitats in the urbanized Specific Plan region, and the scarcity of ground squirrel burrows in most of the Specific Plan area. Because the Specific Plan area lacks high-quality burrowing owl habitat and is not known or expected to support breeding burrowing owls or large numbers of nonbreeding birds, loss of habitat as a result of Specific Plan implementation would not rise to the CEQA standard of a substantial adverse effect on regional populations of the species.

Nevertheless, to the extent that burrowing owls use the Specific Plan area, project activities could potentially disturb foraging and roosting individuals. Because they roost underground, burrowing owls may be killed or injured during construction activities if occupied burrows are destroyed or compacted by heavy equipment. Construction activities that occur in close proximity to active burrows may disturb owls to the point of abandoning their burrows, exposing them to increased predation risk as they disperse. Due to the rarity of the burrowing owl in the region and the effects on burrowing owl populations of the loss of any individuals, the loss of individual burrowing owls would be significant under CEQA. Implementation of MM BIO-16 will reduce these impacts to less-than-significant levels.

Mitigation Measure BIO-16. Burrowing Owl Minimization Measures. To minimize impacts on burrowing owls, the following measures will be implemented.

- **Preconstruction Surveys.** Preconstruction surveys for burrowing owls will be conducted prior to the initiation of construction activities within suitable burrowing owl roosting or nesting habitat (i.e., grassland or ruderal habitats), or within 250 ft of this habitat. During the initial site visit, a qualified biologist will survey the entire project site and (to the extent that access allows) areas within 250 ft by walking transects with centerlines no more than 50 ft apart and ensure complete visual coverage and looking for suitable

burrows that could be used by burrowing owls. If no suitable burrows are present, no additional surveys are required. If suitable burrows are determined to be present within 250 ft of project impact areas, a qualified biologist will conduct a second survey to determine whether owls are present in areas where they could be affected by proposed activities. The surveys will last a minimum of three hours, beginning one hour before sunrise and continuing until 2 hours after sunrise or beginning 2 hours before sunset and continuing until 1 hour after sunset. The first survey may occur up to 14 days prior to the start of construction activities in any given area, and the second survey will be conducted within two days prior to the start of construction activities.

- **Implement Buffer Zones for Burrowing Owls.** If burrowing owls are detected during the pre-activity survey, a 165-ft buffer, within which no newly initiated construction-related activities should occur, will be maintained between construction activities and occupied burrows to the extent feasible during the nonbreeding season (September 1 through January 31). This buffer may be reduced if a qualified biologist determines that work will not result in damage to the burrow(s) being used by the owls. Though the species is highly unlikely to breed in the Specific Plan area, owls present between February 1 and August 31 will be assumed to be nesting, and a 250-ft protected area will remain in effect until August 31, or until the burrow is no longer occupied, whichever occurs first.
- **Passive Relocation.** No burrowing owls shall be relocated from burrows during the breeding season (February 1 through August 31). If, during the nonbreeding season (September 1 through January 31), it is infeasible to maintain a buffer around occupied burrow(s) large enough to ensure that the burrow(s) will not be physically disturbed (thus risking injury or mortality of the owl), the owl may be passively relocated from the occupied burrow(s) using one-way doors. Passive relocation shall be performed only by a qualified biologist. One-way doors must be in place for a minimum of 48 hours, during dry conditions, to ensure that owls have left the burrow before the burrow is impacted.

6.1.7 Impacts on the Western Snowy Plover (Less than Significant with Mitigation)

The 2012 EIR did not address potential impacts on western snowy plovers. Western snowy plovers are not expected to nest or even forage within the Specific Plan area, as suitable habitat is absent from the Specific Plan area. However, the species is known to nest in salt panne habitat in Pond SF 2 north of the Specific Plan area at the Ravenswood Complex of the Don Edwards-San Francisco Bay National Wildlife Refuge. The nearest potential nesting and foraging habitat occurs in the southwest corner of Pond SF 2; depending on water levels within that pond, suitable salt panne habitat may be present as close as approximately 300 ft north of the Specific Plan's northern boundary. Typically, the USFWS recommends a 600-ft buffer between active snowy plover nests and construction activities or other areas of intensive human activity to avoid disturbance of nesting plovers. Therefore, if individual project activities in the northwest corner of the Specific Plan area were to occur within 600 ft of active nests, heavy ground disturbance, noise, and vibrations caused by construction of independent projects could potentially result in the abandonment of nests, and possibly the loss of eggs or young as a result. However, due to the presence of the elevated rail line, trees and shrubs along the rail line, and the southern Pond SF 2 levee between the Specific Plan area and Pond SF 2 – all of which help to screen human activity in the Specific Plan area from plovers in Pond SF 2 – Specific Plan activities other than heavy

construction are not expected to disturb nesting plovers. In addition, Specific Plan activities that subsidize or attract nuisance and predatory species that might then prey on snowy plovers and their eggs and chicks, or that provided high-quality perches for avian predators, could increase predation on snowy plovers. Due to the rarity of this species, such impacts would be considered significant impact under CEQA in the absence of mitigation measures. Implementation of MM BIO-8, BIO-9, and BIO-11 described in Section 6.1.3 will minimize predation-related impacts, and MM BIO-17 will reduce potential impacts related to disturbance of active nests to less-than-significant levels.

Mitigation Measure BIO-17. Seasonal Avoidance and Buffers. No Specific Plan construction activities will be performed within 600 ft of an active snowy plover nest during the snowy plover breeding season, March 1 through September 14. Prior to the initiation of any activities within 300 ft of the southwest corner of Pond SF 2, north of the Specific Plan area during the period March 1 through September 14, a qualified biologist will conduct a survey for suitable habitat for nesting snowy plovers, and for active nests. If no suitable nesting habitat or active nests are present within 600 ft of the proposed activity, construction may proceed. If an active nest is present, no construction activities will commence within 600 ft of the nest until the nest is no longer active.

6.1.8 Impacts on Nesting Birds (Less than Significant with Mitigation)

Construction disturbance during the bird nesting season (February 1 through August 31, for most species) could result in the incidental loss of eggs or nestlings of native birds, either directly through the destruction or disturbance of active nests or indirectly by causing enough disturbance that adults abandon their nests. Impacts on some special-status birds, including the California Ridgway's rail and California black rail (Section 6.1.4), burrowing owl (Section 6.1.6), and western snowy plover (Section 6.1.7) have been previously addressed. In addition to those four species, several other special-status birds may nest in or adjacent to the Specific Plan area. The Alameda song sparrow, Bryant's savannah sparrow, San Francisco common yellowthroat, and northern harrier (all California species of special concern), as well as the white-tailed kite (state fully-protected species), are associated with wetland and/or grassland habitats and are known to nest in or near the Specific Plan area. Impacts to these bird species of special concern were not specifically discussed in the 2012 EIR.

San Francisco common yellowthroats, Alameda song sparrows, Bryant's savannah sparrows, and northern harriers may nest in marsh or adjacent upland vegetation along the eastern margins of the Specific Plan area, and white-tailed kites may nest in trees in or near the Specific Plan area. Due to the potential proximity of nesting to Specific Plan activities, eggs or young in nests of these species may be killed or injured during construction activities as a result of destruction by construction personnel or equipment, or removal of vegetation containing nests. In addition, construction activities causing a substantial increase in noise, movement of equipment, or human presence near) active nests could result in the abandonment of nests, and possibly the loss of eggs or young as a result. Increased human activity may also affect the behavior of birds, causing them to avoid work sites and possibly exposing them to increased competition with other birds in the areas to which they disperse and to increased levels of predation caused by their unfamiliarity with the new area. Increases in human concentration and activity associated with construction in the vicinity of the project

site may also result in an increase in native and nonnative predators that would be attracted to trash left in the work site, and in a reduction in the quality of breeding or foraging habitat caused by the introduction of nonnative vegetation. In addition, increased sedimentation or hazardous material spills from construction activities may result in the temporary or permanent degradation of water quality and, hence, habitat quality in wetland habitats downstream from work sites, which could negatively affect habitat quality for these species. Following completion of construction, increased human activity in and near these species' habitats and near nests could potentially disturb these species to the point that they no longer occupy suitable habitat on or near the project site.

Because these species occur mainly in the undeveloped habitats along the eastern margin of the site, and because the majority of these areas will remain undeveloped, permanent impacts to their breeding and foraging habitats will be limited. These species are not particularly rare in the region, and suitable habitat for these species within the region is relatively abundant. Therefore, the permanent loss and/or temporary disturbance nesting and foraging habitat for these species in the Specific Plan area would not result in appreciable impacts on their regional populations.

However, one to several pairs of any of these species could potentially nest within the Specific Plan area, or close enough to the Specific Plan area (e.g., within 300 ft for raptors and 100 ft for other birds) to potentially be affected by construction activities and subsequent use of the project site. In addition, numerous other, non-special-status birds nest in the Specific Plan area, and they may be impacted by Specific Plan activities in the same ways described above for special-status birds. Given the large size of the Specific Plan area, impacts of construction activities could affect relatively large numbers of nesting birds. Implementation of MM BIO-18 will reduce these potential impacts to a less-than significant level.

Mitigation Measure BIO-18. Nesting Bird Avoidance. The following measures will be implemented to avoid and minimize impacts of Specific Plan activities on nesting birds.

- **Seasonal Avoidance.** To the extent feasible, vegetation removal, demolition, and initiation of grading and other construction activities should be scheduled to avoid the nesting season. If such activities take place outside the nesting season, all impacts on nesting birds protected under the MBTA and California Fish and Game Code will be avoided. The nesting season for most birds in San Mateo County extends from February 1 through August 31.
- **Preconstruction/Pre-disturbance Surveys.** If it is not possible to schedule vegetation removal, demolition, and construction activities between September 1 and January 31, then preconstruction surveys for nesting birds shall be conducted by a qualified biologist to ensure that no nests of migratory birds will be disturbed during project implementation. These surveys shall be conducted no more than 7 days prior to the initiation of tree removal, demolition, ground disturbance, or construction activities for each construction phase. During this survey, the biologist will inspect all potential nesting habitats (e.g., trees, shrubs, buildings, electrical towers, and the ground) in and immediately adjacent to the impact areas for migratory bird nests.

- **Buffers.** If an active nest is found within areas that would be disturbed by project activities, the qualified biologist will determine the extent of a construction-free buffer zone to be established around the nest (typically 300 ft for raptors and 100 ft for other species, though buffers may be reduced by the biologist based on intervening structures or vegetation, the magnitude of disturbance produced by the activity, and the level of human activity to which the birds are already habituated), to ensure that no active nests of species protected by the MBTA and California Fish and Game Code will be disturbed during project implementation.
- **Inhibition of Nesting.** If construction activities will not be initiated until after the start of the nesting season, all potential nesting substrates (e.g., bushes, trees, grasses, and other vegetation) that are scheduled to be removed by the project may be removed prior to the start of the nesting season (e.g., prior to February 1) to reduce the potential for establishment of nests in areas to be disturbed.

6.1.9 Impacts on Non-breeding Special-Status Animals (Less than Significant)

Several special-status bird and mammal species occur in the Specific Plan area as non-breeding migrants, transients, or foragers, but they are not known or expected to breed or occur in large numbers in the project area; these include birds such as the California least tern, tricolored blackbird, and loggerhead shrike, and mammals such as the pallid bat, Townsend's big-eared bat, and western red bat.

Implementation of Specific Plan activities would not result in the injury or mortality of any individuals of these species, which are mobile enough to avoid construction equipment. None of these species is expected to occur on the site in large numbers or use the site regularly, and thus, Specific Plan activities are expected to result in the disturbance of few, if any, individuals of these species. Specific Plan activities could result in the permanent loss and temporary disturbance of a small amount of grassland or ruderal/barren foraging habitat for these species, or roosting sites for western red bats. In addition, construction-related disturbance may result in the alteration of foraging patterns (e.g., avoidance of work sites because of increased noise and activity levels during project activities) of a few individuals of these species. However, the Specific Plan area site does not provide important or extensive foraging habitat that is used regularly or by large numbers of any of these species, and is not heavily relied upon by a breeding pair of any of these species. Thus, impacts on these species and their foraging habitats resulting from independent projects would be very limited. Accordingly, Specific Plan activities would not result in substantial reductions in local or regional populations of these species, and would affect a very low proportion of regionally available habitat. Therefore, such an impact would be less than significant under CEQA.

6.1.10 Impacts of Increased Lighting on Animals (Less than Significant with Mitigation)

Potential impacts from increased lighting associated with the implementation of the Specific Plan were not discussed in the 2012 EIR. Independent projects in the Specific Plan area will construct buildings, other features (e.g., pedestrian walkways and parking areas), and the proposed Loop Road, that may increase the amount of lighting within and around the Specific Plan area. Lighting would be the result of fixtures illuminating buildings, building architectural lighting, parking lot and pedestrian lighting, as well as Loop Road lighting fixtures along

the road and multiuse pathways. Depending on the location, direction, and intensity of the project's exterior lighting elements, lighting can potentially spill into adjacent natural areas, thereby resulting in an increase in lighting compared to existing conditions. Areas to the west and south of the project site are primarily developed areas that do not support sensitive species that might be significantly impacted by illuminance from the project. However, areas along the eastern and northern margins of the Specific Plan area include or are adjacent to salt marsh habitats supporting a variety of wildlife species, including sensitive species such as the salt marsh harvest mouse, salt marsh wandering shrew, California black rail, California Ridgway's rail, western snowy plover, and other special-status birds.

Many animals are sensitive to light cues, which influence their physiology and shape their behaviors, particularly during the breeding season (Ringer 1972, de Molenaar et al. 2006). Artificial light has been used as a means of manipulating breeding behavior and productivity in captive birds for decades (de Molenaar et al. 2006), and has been shown to influence the territorial singing behavior of wild birds (Longcore and Rich 2004, Miller 2006, de Molenaar et al. 2006). While it is difficult to extrapolate results of experiments on captive birds to wild populations, it is known that photoperiod (the relative amount of light and dark in a 24-hour period) is an essential cue triggering physiological processes as diverse as growth, metabolism, development, breeding behavior, and molting (de Molenaar et al. 2006). This holds true for birds, mammals (Beier 2006), and other taxa as well, suggesting that increases in ambient light may interfere with these processes across a wide range of species, resulting in impacts on wildlife populations.

Artificial lighting may indirectly impact mammals and birds by increasing the nocturnal activity of predators such as owls, hawks, and mammalian predators (Negro et al. 2000, Longcore and Rich 2004, DeCandido and Allen 2006, Beier 2006). The presence of artificial light may also influence habitat use by rodents (Beier 2006) and by breeding birds (Rogers et al. 2006, de Molenaar et al. 2006) by causing avoidance of well-lit areas, resulting in a net loss of habitat availability and quality.

Up-lighting refers to light that projects upwards above the fixture. There are two primary ways in which the luminance of up-lights might impact the movements of birds. First, local birds using habitats on a site may become disoriented during flights among foraging areas and fly toward the lights, colliding with the lights or with nearby structures. Second, nocturnally migrating birds may alter their flight direction or behavior upon seeing lights; the birds may be drawn toward the lights or may become disoriented, potentially striking objects such as buildings, adjacent power lines, or even the lights themselves.

Wildlife species using the undeveloped habitats within and adjacent to the Specific Plan area may be subject to increased predation, decreased habitat availability (for species that show aversion to increased lighting), and alterations of physiological processes if projects produce appreciably greater illuminance than the existing conditions. New lighting has some potential to attract and/or disorient birds, especially during inclement weather when nocturnally migrating birds descend to lower altitudes. As a result, some birds moving along the San Francisco Bay at night may be (1) attracted to the Specific Plan area, where they are more likely to collide with buildings, and/or (2) disoriented by night lighting, potentially causing them to collide with the buildings (bird collision impacts are described further in Section 6.2.4). This impact on local wildlife populations is

potentially significant under CEQA due to the high ecological value of these adjacent habitat areas and the rarity of some of the species inhabiting these areas. MM BIO-19 shall be implemented to minimize lighting as part of project design, thereby reducing this impact to a less-than-significant level.

Mitigation Measure BIO-19. Lighting Impact Reduction Measures. Measures shall be implemented to reduce spillover of lighting into, or glare/increased luminance perceived by animals using, natural habitats along the margins of the Specific Plan area, as well as adverse effects of lighting on migratory birds.

- Exterior lighting shall be minimized (e.g., by turning lights off) in accordance with recommendations from the International Dark-Sky Association (2022) from midnight until dawn, at a minimum, except as needed for safety and City code compliance. Exterior lighting within the Specific Plan area shall be shielded to block illumination from shining upward or outward into the sensitive habitats (i.e., salt marshes) within and adjacent to the Specific Plan area. Uplighting shall be avoided.
- Spillage of lighting from building interiors shall be minimized using occupancy sensors, dimmers, or other mechanisms from midnight until dawn, at a minimum, during bird migration seasons (February–May and August–November). If desired, this measure may be voluntarily implemented year-round.

6.2 Impacts on Sensitive Communities: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS (Less than Significant)

6.2.1 Impacts on Riparian Habitat or Other Sensitive Natural Communities (Less than Significant with Mitigation)

The 2012 EIR briefly discusses impacts to riparian or other sensitive natural communities in the context of impacts to northern coastal salt marsh, which is considered a sensitive habitat by the CDFW. This habitat is present in the northeastern part of the Specific Plan area between University Village and Ravenswood OSP, the northwest corner, and the Specific Plan area's northern boundary. Some is also found along Bay Road towards Cooley Landing. Loss of northern coastal salt marsh would be a significant impact; because that plant community is also regulated as waters of the U.S./state, impacts of Specific Plan activities on northern coastal salt marsh are described in further detail in Section 6.3 below, and implementation of MM BIO-20, BIO-21, and BIO-22 will reduce impacts on northern coastal salt marsh to less-than-significant levels. No riparian habitat or other sensitive natural communities are present in the Specific Plan area or would be impacted by Specific Plan activities.

6.2.2 Impacts Caused by Nonnative and Invasive Species (Less than Significant with Mitigation)

The 2012 EIR did not discuss potential impacts due to nonnative and invasive species. However, a number of nonnative, invasive plant species occur in the Specific Plan area. Of these, perennial peppergrass, ice plant, and yellow star-thistle have the potential to cause the most severe ecological impacts. In addition, fennel, black mustard, and wild oats were observed in the Specific Plan area and can have substantial and apparent ecological impacts if they spread into native, sensitive habitats (Cal-IPC 2022). Invasive species can spread quickly and be difficult to eradicate, as they produce seeds that germinate readily following disturbance. Further, disturbed areas are highly susceptible to colonization by nonnative, invasive species that occur locally, or whose propagules are transported by personnel, vehicles, and other equipment.

Specific Plan activities would result in soil disturbance in areas adjacent to sensitive salt marsh and tidal slough habitats. Activities such as trampling, equipment staging, and vegetation removal are all factors that would contribute to disturbance. Areas of disturbance could serve as the source for promoting the spread of nonnative species, which could degrade the ecological values of the wetlands that occur on and immediately adjacent to the Specific Plan area, and adversely affect native plants and wildlife that occur there. The introduction or spread of invasive weeds into sensitive wetland habitats would be a significant impact under CEQA. Implementation of MM BIO-20 will reduce this impact to a less-than-significant level.

In addition to nonnative plants, nonnative animals may benefit from Specific Plan activities. Nonnative animals such as house mice, Norway rats, black rats, and feral cats can compete with and/or prey upon sensitive native animals. Provision of shelter and food for nonnative animals, particularly as a result of outdoor feeding of feral cats and improper disposal of human food waste, subsidizes populations of these nonnative species at the expense of native animals. Implementation of MM BIO-10 and BIO-11 will reduce such impacts to less-than-significant levels.

Mitigation Measure BIO-20. Implement Invasive Weed BMPs. The invasion and/or spread of noxious weeds will be avoided by the use of the following invasive weed BMPs:

- Prohibit the use of moderate or highly invasive and/or noxious weeds (as defined by California Department of Food and Agriculture and California Invasive Plant Council) for landscaping.
- During project construction, all seeds and straw materials used in the Specific Plan area shall be certified weed-free rice (or similar material acceptable to the City) straw, and all gravel and fill material will be certified weed-free to the satisfaction of the City. Any deviation from this will be approved by the City.
- During project construction within, or within 100 ft of, tidal salt marsh, open water, or tidal slough habitats, vehicles and all equipment shall be washed (including wheels, undercarriages, and bumpers) before and after entering the proposed project footprint. Vehicles will be cleaned at existing construction yards or car washes.

- Following construction of project, a standard erosion control seed mix (acceptable to the City) from a local source, and free of invasive species, will be planted within the temporary impact zones on any disturbed ground that will not be under hardscape, landscaped, or maintained. This will minimize the potential for the germination of the majority of seeds from nonnative, invasive plant species.
- To avoid mobilizing weed seeds, use of landscaping blowers within 100 feet of the edge of salt marsh is prohibited.

6.3 **Impacts on Wetlands:** Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means (Less than Significant with mitigation)

Waters of the U.S./state are present in the form of the tidal salt marsh, open water, and tidal slough habitats in the eastern portion of the Specific Plan area. The 2012 EIR determined that wetland habitat could be disturbed to install subsurface infrastructure, or filled and lost as a consequence of development under the Specific Plan, and that these impacts would be less than significant with mitigation.

Although most Specific Plan activities may be able to avoid impacts on jurisdictional wetlands and other waters, Specific Plan activities could potentially impact jurisdictional waters through placement of fill; loss or degradation of wetland vegetation; temporary or permanent alteration of hydrology; or degradation of water quality through increased sedimentation, turbidity, and contamination with chemicals. In particular, if the Loop Road is constructed it will impact wetlands and other waters of the U.S./state where it would overlap open water and tidal salt marsh habitat. Wetlands may also be impacted by invasion by nonnative plants; implementation of MM BIO-20 will address that impact.

Shading from buildings constructed along the eastern margins of the Specific Plan area could also have some effect on vegetation in salt marsh habitats. Current building height restrictions in the Specific Plan area limit the tallest office buildings to eight stories above grade in the Waterfront Office and Ravenswood Flex Overlay zone, which occur directly adjacent to sensitive salt marsh habitats. Buildings in other development zones adjacent to sensitive salt marshes are limited to lower heights, between three and five stories above grade. All of these buildings have some potential to cast shadows over tidal marsh habitats to the east during the late afternoon and evening, when the sun is in the west. However, all new buildings would be constructed outside the 100-ft BCDC setback, thus limiting the amount of shade that will reach the tidal salt marsh habitat throughout the day. These marshes are also expected to remain open to the sky to the north, south, and east, and are expected to receive enough light that shading from the buildings would not result in substantial adverse effects on marsh vegetation.

Construction could result in impacts on water quality, which would degrade these sensitive habitats. Construction projects in California causing land disturbances that are equal to 1 ac or greater must comply with state requirements to control the discharge of stormwater pollutants under the NPDES *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit; Water

Board Order No. 2009-0009-DWQ). Prior to the start of construction/demolition, a Notice of Intent must be filed with the State Water Board describing the project. A SWPPP must be developed and maintained during the project and it must include the use of BMPs to protect water quality until the site is stabilized. Standard permit conditions under the Construction General Permit require that the applicant utilize various measures including: on-site sediment control BMPs, damp street sweeping, temporary cover of disturbed land surfaces to control erosion during construction, and utilization of stabilized construction entrances or wash racks, among other elements. Implementation of MM BIO-14 and BIO-15 would further reduce such water-quality impacts. Nevertheless, in the absence of additional mitigation measures, Specific Plan activities could result in significant impacts to jurisdictional wetlands and other waters. Implementation of MM BIO-21 and BIO-22 will reduce such impacts to less-than-significant levels.

Mitigation Measure BIO-21. Jurisdictional Waters Avoidance and Minimization Measures. The following measures will be implemented to avoid and minimize impacts to jurisdictional wetlands and other waters.

- During or prior to project design, a wetland delineation of the project area shall be conducted to determine precise boundaries of jurisdictional wetlands and other waters. Impacts to any jurisdictional habitats shall be avoided to the extent practicable. If wetlands or other waters under state or federal jurisdiction occur in the construction areas and involve the placement of fill or dredged materials or other alteration, the necessary and appropriate permits and approvals from responsible resources agencies shall be secured. As appropriate for the type of permit to be considered, options that avoid, minimize, or mitigate potential impacts on jurisdictional wetlands shall be evaluated. Conditions of approval attached to the permits shall be followed.

- Sensitive habitat areas including wetlands adjacent to, but outside of, the construction area shall be demarcated with orange construction fencing to exclude workers, vehicles, and equipment.

- The locations of habitats to be avoided shall be identified in the contract documents (plans and specifications) as "Sensitive Biological Resources – Do Not Disturb."

- Jack-and-bore or other trenchless methods shall be used as feasible to reduce the need for surface construction within identified sensitive habitats and exclusion zones, and construction activities and vehicles shall be restricted to a specified right-of-way.

- Temporarily impacted wetlands and other waters shall be restored in place based on a restoration plan prepared by a qualified biologist and approved by the City.

- Where possible, trenches shall be worked from only one side to minimize impacts on adjacent habitat.

- Watering of exposed earth shall be conducted consistent with construction BMPs to minimize dust production.

- Trench lines shall be reseeded with native vegetation appropriate for the affected habitat type, and/or a double-trenching technique shall be used through sensitive habitats to help preserve the existing seedbank.

- Any imported fill within wetlands shall be clean with no pathogens or weed seeds. When seed mixes are applied to wetlands, only specialized mixes with locally collected seed from coastal salt marsh plant species that occur in the habitat shall be utilized.

Mitigation Measure BIO-22. Jurisdictional Waters Compensatory Mitigation. If impacts to jurisdictional wetlands or other waters cannot be avoided, compensatory mitigation shall be provided as follows (or as otherwise required by conditions of applicable resource agency permits). Compensatory mitigation shall be provided via the purchase of credits from a wetland mitigation bank; project-specific mitigation via the creation or restoration of the same general type of wetlands/waters impacted; or some combination of the two approaches. Compensatory mitigation shall be provided at a minimum ratio of 2:1 (mitigation:impact) on an acreage basis if project-specific mitigation is performed or 1:1 if credits are purchased from a mitigation bank. Mitigation performed for loss of salt marsh harvest mouse and salt marsh wandering shrew habitat, as described in MM BIO-5, may be adequate compensation for impacts to jurisdictional waters if performed via purchase of credits in a wetland mitigation bank and/or creation of suitable wetlands as described below.

If project-specific mitigation is provided as compensatory mitigation, the applicant will prepare an HMMP describing the measures that will be taken to create, restore, or enhance appropriate habitats and to monitor mitigation success. The HMMP will include, at a minimum, the following:

- A summary of project impacts on jurisdictional habitats and the proposed mitigation of these impacts;
- A description of the location and boundaries of the mitigation site and a description of existing mitigation site conditions;
- A description of measures to be undertaken, if necessary, to create, restore, or enhance appropriate habitats;
- Proposed management activities, such as management of invasive plants, to maintain high-quality habitat conditions;
- A description of community monitoring measures on the mitigation site, including specific, objective goals and objectives, performance indicators, success criteria, monitoring methods, data analysis, reporting requirements, and monitoring schedule. At a minimum, success criteria will include demonstration of at least 75% cover by native wetland plants within the mitigation area. Monitoring will occur until these criteria are achieved but for no less than 5 years;
- A description of the HMMP's adaptive component, including potential contingency measures for mitigation elements that do not meet performance criteria; and
- A description of the funding mechanism to ensure the long-term maintenance and monitoring of the mitigation lands.

The HMMP will be approved by the City and any agencies involved in issuing permits for the specific project in question (e.g., USACE and RWQCB) prior to the initiation of impacts to jurisdictional wetlands or other waters.

6.4 Impacts on Wildlife Movement: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (Less than Significant with Mitigation)

6.4.1 Impacts on Wildlife Movement (Less than Significant with Mitigation)

The Specific Plan area is heavily urbanized, and, as discussed in Section 4.3, the interior of the Specific Plan area does not provide a particularly important area for movement by non-flying wildlife due to the impediments posed by roads, buildings, fences, and other structures. In general, animals are able to move relatively unimpeded along the rail line on the northern edge of the Specific Plan area and along the upland/tidal marsh interface on the eastern edge of the Specific Plan area. However, the construction of the Loop Road would impede wildlife movement in these areas by increasing human activity (and potentially vehicular activity) and lighting within the narrow strip of wetland-upland ecotone in the northeast part of the Specific Plan area where wildlife movement is expected to be concentrated. Given the importance of wildlife movement along the edge of the baylands to populations of mammals in particular, this would be a significant impact. Implementation of Mitigation Measures BIO-4 (including restoration of ecotone vegetation on the marsh side of the Loop Road) and 19 (to minimize lighting impacts) would mitigate the impacts of the Loop Roard on wildlife movement to less than significant levels.

Due to the proximity of the Specific Plan area to the edges of the San Francisco Bay, birds moving along the Pacific Flyway will fly past the Specific Plan area in moderate abundance during spring and fall migration. Because independent projects may construct new buildings along the urban margins of the Specific Plan area, birds may encounter these buildings and collide with any glazing that is present on their facades. Potential impacts due to bird collisions with Specific Plan-associated buildings, as well as mitigation measures to reduce these impacts to a less-than-significant level, are discussed in more detail in the following section.

6.4.2 Impacts due to Bird Collisions (Less than Significant with Mitigation)

Under existing conditions, terrestrial land uses and habitat conditions on the Specific Plan area are primarily urbanized. Vegetation in most of these areas is very limited in extent, and consists primarily of nonnative landscaped trees and shrubs. Nonnative vegetation supports fewer of the resources required by native birds than native vegetation, and the structural simplicity of the vegetation (without well-developed ground cover, understory, and canopy layers) further limits resources available to birds. Thus, although a number of bird species will regularly use the vegetation in the Specific Plan area, these species either (a) typically do so in low numbers, or (b) are regionally abundant, urban-adapted species.

The exception to these conditions occurs along the eastern margins of the Specific Plan area, adjacent to Ravenswood OSP and Palo Alto Baylands Nature Preserve, which provide habitat for many species of waterbirds and marsh-associated birds. A review of eBird hotspots in the immediate project vicinity indicates that approximately 157 species of birds are found throughout the Ravenswood OSP, while 166 are found in the marshes of the Palo Alto Baylands directly east of the Specific Plan area (Cornell Lab of Ornithology 2022). The majority of these species are common resident, migrant, or wintering wading birds, waterfowl, and passerines (i.e., songbirds).

Under proposed conditions, land use is expected to intensify, and development of new structures will occur in close proximity to the open salt marsh and grassland habitats in and adjacent to the eastern portions of the Specific Plan area. Specific Plan zoning in close proximity to the open habitats along the eastern margin of the Specific Plan area includes the following land use designations (north to south): Ravenswood OSP, Ravenswood Flex Overlay, Waterfront Office, Ravenswood Employment center, Industrial Transition, and Urban Residential. In all but the Ravenswood OSP, land uses will be converted primarily office/research and development buildings with a smaller amount of light industrial and moderate-density residential structures toward the south. Depending on the extent and type of vegetation included in proposed projects within these areas, bird use after project completion in these areas is expected to either remain similar due to a continued scarcity of vegetation, or increase with increasing quality of habitat offered by the landscape vegetation.

Shorebirds and waterbirds are unlikely to disperse from the San Francisco Bay, Ravenswood OSP, or the Baylands Preserve into developed areas, as these species are strongly associated with tidal habitats and open water. However, large numbers of migratory landbirds occur along the edges of San Francisco Bay during spring and fall migration. Such species tend to concentrate in more heavily vegetated areas such as riparian corridors or large, well-vegetated parks such as Coyote Point in San Mateo, or Shoreline Park in Mountain View. No heavily vegetated park areas or natural habitat such as riparian vegetation is present in the vicinity of the Specific Plan area to attract large concentrations of migrating songbirds (or would be present with project implementation), and the Specific Plan area is not located between two high-quality habitat areas such that songbirds would be flying past the Specific Plan area at an altitude as low as the proposed buildings. As a result, there is no expectation that very large numbers of migratory songbirds would be particularly attracted to, or would make heavy use of, the habitats in the Specific Plan area. Nevertheless, moderate numbers of migrant landbirds moving through the Bay area in spring and fall will use the landscaped areas in the Specific Plan area, particularly along the upland/baylands interface on the eastern edge of the Specific Plan area.

It has been well documented that glass windows and building façades can result in injury or mortality of birds due to birds' collisions with these surfaces (Klem 2009, Sheppard and Phillips 2015). Because birds do not perceive glass as an obstruction the way humans do, they may collide with glass when the sky or vegetation is reflected in glass (e.g., they see the glass as sky or vegetated areas); when transparent windows allow birds to perceive an unobstructed flight route through the glass (such as at corners); and when the combination of transparent glass and interior vegetation (such as in planted atria) results in attempts by birds to fly through glass to reach that vegetation. The greatest risk of avian collisions with buildings occurs in the area within 40–60 ft of the ground because this is the area in which most bird activity occurs (San Francisco Planning

Department 2011, Sheppard and Phillips 2015). Very tall buildings (e.g., buildings 500 ft or more high) may pose a threat to birds that are migrating through the area, particularly to nocturnal migrants that may not see the buildings or that may be attracted to lights on the buildings (San Francisco Planning Department 2011).

Given that a moderate number of migratory landbirds, as well as urban-adapted residents, are expected to occur along the eastern margins of the Specific Plan area, there is potential for avian collisions with new buildings to occur frequently enough, over time, to result in a significant impact to regional populations. Appendix B of the Specific Plan includes bird-safe building standards that are largely sufficient to reduce these impacts to less-than-significant levels under CEQA. However, we recommend several additions and modifications to the text of these standards to reliably reduce impacts due to bird collisions to less-than-significant levels. Relevant excerpts from the standards are shown below; corrections are underlined, bold, and italicized.

Bird-Safe Glazing Treatments

A. Bird-safe glazing treatments shall be used within the façade collision zone such that no more than 10 percent of a building façade consists of untreated glazing.

B. Bird-safe glazing treatments shall be used on the entirety of a ***feature*** collision zone's glazing.

C. Bird-safe glazing treatments may include any of the following:

i. Fritting.

ii. Permanent stencils.

iii. Frosted glass.

iv. Exterior screens.

v. Physical grids placed on the exterior of glazing.

vi. Ultraviolet (UV) patterns visible to birds.

D. Bird-safe glazing treatments shall include vertical elements that are at least one-quarter inch wide, with a minimum spacing of four inches. In addition, treatments shall include horizontal elements that are at least one-eighth inch wide, with a maximum spacing of two inches.

Lighting. ***Lighting shall comply with Mitigation Measure BIO-19 in Section 6.1.10, above.***

Wind Generation. Any wind-generation device shall be a vertical generator that presents a solid appearance.

Modifications. The requirements of this section may be modified through the design review process, provided that other methods employed to prevent bird strikes ***are reviewed and approved by a qualified biologist***.

6.5 Impacts due to Conflicts with Local Policies: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (Less than Significant with Mitigation)

6.5.1 Impacts Related to General Plan (Less than Significant with Mitigation)

The City of East Palo Alto's General Plan Conservation and Open Space Policy 2.1, states "Conserve, protect, and maintain important natural plant and animal communities, such as the Baylands, Cooley Landing, the shoreline, and significant tree stands." Impacts to the important natural plant community represented by the northern coastal salt marsh would be in conflict with that policy. Implementation of MM BIO-14, BIO-15, and BIO-20 through BIO-22, as described in Section 6.3, would reduce conflicts with Policy 2.1 to less-than-significant levels by mitigating impacts of Specific Plan activities on northern coastal salt marsh.

6.5.2 Impacts on Regulated Trees (Less than Significant)

The City of East Palo Alto's tree ordinance protects trees having a trunk diameter equal to or greater than 12.7 inches. A number of trees meeting this criterion are likely to be removed by Specific Plan activities. These trees do not provide substantial habitat values or functions, and the majority of the trees in the Specific Plan area are nonnative, ornamental species. Because the majority of trees on the site are nonnative species, the ecological impact of tree removal from Project activities would be somewhat limited. However, failure to comply with a local ordinance regulating tree removal would be a significant impact. Therefore, all Specific Plan activities will comply with the City's tree ordinance, including measures to protect trees where feasible; obtaining a tree removal permit when avoidance is infeasible; and complying with any conditions of the tree removal permit, including any tree replacement requirements.

6.6 Impact due to Conflicts with an Adopted Habitat Conservation Plan: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan (No Impact)

The project site is not located within an area covered by an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, the project would not conflict with any such plans.

6.7 Cumulative Impacts

Cumulative impacts arise from the linking of impacts from past, current, and reasonably foreseeable future projects in the region. Future development activities in the Specific Plan area and elsewhere along the Bay edge in the East Palo Alto vicinity will result in impacts on the same types of habitats and species that will be affected by Specific Plan activities. The cumulative impact on biological resources resulting from Specific Plan activities in combination with other projects in the project area and larger region would depend on the relative magnitude of adverse effects of these projects on biological resources compared to the relative benefit of impact avoidance

and minimization efforts prescribed by planning documents, CEQA mitigation measures, and permit requirements for each project; compensatory mitigation and proactive conservation measures associated with each project; and the benefits to biological resources accruing from restoration projects in the region. In the absence of such avoidance, minimization, compensatory mitigation, and conservation measures, cumulatively significant impacts on biological resources would occur.

As discussed in Section 6, Specific Plan activities have the potential to impact a number of biological resources. However, individual projects implementing the Specific Plan will be required by the City to implement applicable mitigation measures to reduce the likelihood and magnitude of those impacts. The majority of the most sensitive biological resources in the Specific Plan area, in terms of sensitive habitats and species, are related to San Francisco Bay marshes and sloughs. Any impacts to such habitats would necessitate resource agency permits, and possibly FESA or CESA consultations. Conditions of resource agency approvals will also be implemented to avoid, minimize, and compensate for such impacts.

The main project in and near the Specific Plan area that is expected to impact sensitive habitats and species similar to those impacted by Specific Plan activities is the San Francisquito Creek Joint Powers Authority's Strategy to Advance Flood Protection, Ecosystems and Recreation along San Francisco (SAFER) Bay project, which consists of engineered and natural flood protection features, habitat restoration, and recreation improvements along the Bay shoreline of East Palo Alto and Menlo Park to protect those communities from coastal flooding. The SAFER Bay project is expected to construct a levee along the shoreline, at the upland/bayland interface. As a result, that project will impact tidal marsh and tidal slough habitats, and habitat for special-status, salt marsh-associated plants and animals, while providing mitigation for such impacts through the restoration of similar habitats elsewhere. In fact, Specific Plan activities are less likely to impact these sensitive biological resources due to the impending SAFER Bay project, as the SAFER Bay project will by necessity be constructed between baylands habitats and the upland areas where Specific Plan activities are most likely to occur. Therefore, planning of Specific Plan activities with accommodation of the SAFER Bay project in mind is expected to minimize impacts of Specific Plan activities on sensitive biological resources.

In addition, regional restoration projects, including the Cooley Landing tidal restoration project that restored tidal marsh in the Ravenswood OSP, and the ongoing South Bay Salt Ponds Restoration Project, will result in substantial enhancement of tidal habitat in the South Bay, thus increasing the extent and quality of the types of sensitive habitats and species that may be impacted by Specific Plan activities. These restoration projects will help avoid significant cumulative impacts, and with implementation of mitigation measures described in this biological resources report, Specific Plan activities will not have a cumulatively considerable contribution to cumulative impacts on biological resources.

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RAVENSWOOD/4 CORNERS TOD SPECIFIC PLAN UPDATE SEIR NOISE AND VIBRATION ASSESSMENT

EAST PALO ALTO, CALIFORNIA

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Prepared for:

Amber Sharpe
Project Manager
David J. Powers & Associates, Inc.
1871 The Alameda, Suite 200
San José, CA 95126

Prepared by:

Adwait Ambaskar
Carrie Janello
Michael Thill

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

I&R Job No.: 22-111

INTRODUCTION

The approximately 207-acre Ravenswood Business District/4 Corners Transit-Oriented Development Specific Plan Update (Specific Plan Update) area is located in the northeastern portion of East Palo Alto. The project area is generally bounded by the City limits/Union Pacific Railroad (UPRR) tracks to the north, the western edge of the Union Pacific Railroad easement along the back of Illinois Street to the west, Weeks Street or Runnymede Street to the south, and the Ravenswood Open Space Preserve and Palo Alto Baylands Nature Preserve to the east. Existing development within the Specific Plan area includes single-family and multi-family residential, retail, medical office, light and general industrial, and civic/institutional land uses. University Village, a single-family neighborhood located immediately east of University Avenue, was formerly located within the Specific Plan area but has been removed in the updated Specific Plan (the Specific Plan Update area is therefore a smaller subset of the original 2013 Ravenswood Specific Plan area which was 350 acres in size). No land use changes are proposed for the University Village neighborhood.

The proposed Specific Plan Update would increase the total amount of development allowed within the Specific Plan area by increasing the maximum square footages for office, R&D/life science, light industrial, civic/community, and tenant amenity, and the total number of residential units allowed under the Specific Plan.

The Supplemental Environmental Impact Report (SEIR) evaluates two development scenarios: Scenario #1 consists of 2.82 million square feet (sf) of office and R&D and 1,350 residential units; Scenario #2 consists of 3.35 million sf of office and R&D and 1,600 residential units. Compared to the 2013 Specific Plan, the proposed update could result in increasing the allowable intensity and height for some land use designations, and a decreasing the allowable intensity and height for others. Under both Buildout Scenarios, all proposed increases in non-residential development square footage would occur on parcels within the Specific Plan Area that currently allow such non-residential land uses. In contrast, the proposed Specific Plan Update would allow for residential uses in more zones/parcels than what is allowed under the 2013 Specific Plan.

The proposed Specific Plan Update also includes amendments to the East Palo Alto General Plan and Zoning Ordinance, which would amend certain existing land use designations in the Specific Plan Area and update existing or establish new development standards to replace current zoning provisions applicable to the Specific Plan area. The future exact allocation of that development will be determined by project-specific applications and approvals but will not exceed the total under cleared this SEIR.

This report evaluates the potential to result in significant noise and vibration impacts with respect to California Environmental Quality Act (CEQA) guidelines. The report is divided into three sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise and groundborne vibration, summarizes applicable regulatory criteria, and discusses the results of the ambient noise monitoring survey completed to document existing noise conditions; 2) the General Plan Consistency Section discusses noise and land use compatibility utilizing policies in the City of East Palo Alto's General Plan; and 3) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate impacts that would result from

implementation of the Specific Plan upon sensitive receptors at a programmatic level, provides a discussion of each impact, and presents measures, where necessary, to mitigate the impacts.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (*frequency*) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is the intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added

to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (*DNL* or L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA L_{dn} with open windows and 65 to 70 dBA L_{dn} if the windows are closed. Levels of 55 to 60 dBA are common along collector streets and secondary arterials, while 65 to 70 dBA is a typical value for a primary/major arterial. Levels of 75 to 80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn}/CNEL as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA L_{dn}/CNEL. At a L_{dn}/CNEL of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the L_{dn}/CNEL increases to 70 dBA, the percentage of the population highly annoyed increases to about 25 to 30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a L_{dn}/CNEL of 60 to 70 dBA. Between a L_{dn}/CNEL of 70 to 80 dBA, each decibel increase, increases by about 3 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the L_{dn}/CNEL is 60 dBA, approximately 30 to 35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro-Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro-Pascals (or 20 micro-Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro-Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2018.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the Peak Particle Velocity (PPV) and another is the Root Mean Square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints.

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, that are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Construction Vibration

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception of vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels such as people in an urban environment may tolerate a higher vibration level.
Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is in a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

Table 3 displays continuous vibration impacts on human annoyance and on buildings. As discussed previously, annoyance is a subjective measure and vibrations may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying.

TABLE 3 Reactions of People and Damage to Buildings From Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect.
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure.
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected.
0.1	Strongly perceptible	Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings.
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential structures.
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures.

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, April 2020.

Regulatory Background

This section describes the relevant guidelines, policies, and standards established by Federal and State Agencies, Santa Clara County, and the City of East Palo Alto. The State CEQA Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

Federal

U.S. Department of Housing and Urban Development (HUD)

HUD environmental criteria and standards are presented in 24 CFR Part 51. New residential construction qualifying for HUD financing proposed in high noise areas (exceeding 65 dBA L_{dn}) must incorporate noise attenuation features to maintain acceptable interior noise levels. A goal of 45 dBA L_{dn} is set forth for interior noise levels and attenuation requirements are geared toward achieving that goal. It is assumed that with standard construction any building will provide sufficient attenuation to achieve an interior level of 45 dBA L_{dn} or less if the exterior level is 65 dBA L_{dn} or less. Approvals in a "normally unacceptable noise zone" (exceeding 65 dBA but not exceeding 75 dBA) require a minimum of 5 dBA additional noise attenuation for buildings if the day-night average is greater than 65 dBA but does not exceed 70 dBA, or minimum of 10 dBA of

additional noise attenuation if the day-night average is greater than 70 dBA but does not exceed 75 dBA.

Federal Highway Administration (FHWA)

Proposed federal or federal-aid highway construction projects at a new location, or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes requires an assessment of noise and consideration of noise abatement per Title 23 of the Code of Federal Regulations, Part 772 (23 CFR Part 772), "Procedures for Abatement of Highway Traffic Noise and Construction Noise." FHWA has adopted noise abatement criteria (NAC) for sensitive receivers such as picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals when "worst-hour" noise levels approach or exceed 67 dBA L_{eq}. The California Department of Transportation (Caltrans) has further defined approaching the NAC to be 1 dBA below the NAC for noise-sensitive receivers identified as Category B activity areas (e.g., 66 dBA L_{eq} is considered approaching the NAC).[1]

Federal Transit Administration (FTA)

The FTA has identified construction noise thresholds in the *Transit Noise and Vibration Impact Assessment Manual*,[2] which limit daytime construction noise to 80 dBA L_{eq} at residential land uses and to 90 dBA L_{eq} at commercial and industrial land uses.

State of California

California Building Code

California Noise Insulation Standards

In 1974 the State of California established minimum noise insulation performance standards for hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family dwellings in Title 25 of the California Administrative Code. These standards were ultimately implemented through Title 24 and the various versions of the California Building Code (most recently Chapter 12, Appendix Section 1207.11 of the 2010 Code). The noise limit was a maximum interior noise level of 45 dBA L_{dn}/CNEL. Where exterior noise levels exceed 60 dBA L_{dn}/CNEL, a report must be submitted with the building plans describing the noise control measures that have been incorporated into the design of the project to meet the noise limit. The State Office of Planning and Research (OPR) Guidelines require the General Plan to facilitate the implementation of the Building Code noise insulation standards. However, the 2013 update (that became effective January 1, 2014) did not include this section of the State Building Code. Most jurisdictions have adopted policies that implement the limits in the Code and extend them to all residential development.

1 Traffic Noise Analysis Protocol, Caltrans Division of Environmental Analysis, May, 2011.

2 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

Cal Green Code

The State of California established exterior sound transmission control standards for new non-residential buildings as set forth in the 2022 California Green Building Standards Code (Section 5.507.4.1 and 5.507.4.2). The sections that pertain to this project are as follows:

> **5.507.4.1 Exterior noise transmission, prescriptive method.** Wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 when the building falls within the 65 dBA L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source, as determined by the local general plan noise element.
>
> **5.507.4.2 Performance method.** For buildings located, as defined by Section 5.507.4.1, wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level ($L_{eq\ (1\text{-}hr)}$) of 50 dBA in occupied areas during any hour of operation.

The performance method that establishes the acceptable interior noise level is the method typically used when applying these standards.

Division of Aeronautic Noise Standards

Title 21 of the California Code of Regulations[3] sets forth the State's airport noise standards. In the findings described in Section 5006, the standard states the following: "A level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a CNEL value of 65 dB for purposes of these regulations. This criterion level has been chosen for reasonable persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech, sleep, and community reaction." Based on this finding, the airport noise standard as defined in Section 5012 is set at a CNEL of 65 dBA.

California Department of Transportation (Caltrans) – Construction Vibration

Caltrans recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards. A conservative vibration limit of 0.25 to 0.30 in/sec PPV has been used for older buildings that are found to be structurally sound but cosmetic damage to plaster ceilings or walls is a major concern. For historic buildings or buildings that are documented to be structurally weakened, a conservative limit of 0.08 in/sec PPV is often used to provide the highest level of protection. All of these limits have been used successfully and compliance with these limits has not been known to result in appreciable structural damage. All

3 California Code of Regulations Airport Noise Standards, Title 21, Public Works Division 2.5, Division of Aeronautics (Department of Transportation), Chapter 6 Noise Standards, Article 1.General.

vibration limits referred to herein apply on the ground level and consider the response of structural elements (i.e. walls and floors) to groundborne excitation.

CEQA Guidelines

The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

(b) Generation of excessive groundborne vibration or groundborne noise levels;

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

County of Santa Clara

Santa Clara County Comprehensive Land Use Plan

The Comprehensive Land Use Plan (CLUP) adopted by the Santa Clara County Airport Land Use Commission contains standards for projects within the vicinity of Norman Y. Mineta San José International Airport that are relevant to this project:
4.3.2.1 Noise Compatibility Policies

N-1 The Community Noise Equivalent Level (CNEL) method of representing noise levels shall be used to determine if a specific land use is consistent with the CLUP.

N-2 In addition to the other policies herein, the Noise Compatibility Policies presented in Table 4-1 shall be used to determine if a specific land use is consistent with this CLUP.

N-3 Noise impacts shall be evaluated according to the Aircraft Noise Contours presented on Figure 5 (not shown in this report).

N-6 Noise level compatibility standards for other types of land uses shall be applied in the same manner as the above residential noise level criteria. Table 4-1 presents acceptable noise levels for other land uses in the vicinity of the Airport.

Table 4 - 1

NOISE COMPATIBILITY POLICIES

LAND USE CATEGORY	CNEL					
	55-60	60-65	65-70	70-75	75-80	80-85
Residential – low density Single-family, duplex, mobile homes	*	**	***	****	****	****
Residential – multi-family, condominiums, townhouses	*	**	***	****	****	****
Transient lodging - motels, hotels	*	*	**	****	****	****
Schools, libraries, indoor religious assemblies, hospitals, nursing homes	*	***	****	****	****	****
Auditoriums, concert halls, amphitheaters	*	***	***	****	****	****
Sports arena, outdoor spectator sports, parking	*	*	*	**	***	****
Playgrounds, neighborhood parks	*	*	***	****	****	****
Golf courses, riding stables, water recreation, cemeteries	*	*	*	**	***	****
Office buildings, business commercial and professional, retail	*	*	**	***	****	****
Industrial, manufacturing, utilities, agriculture	*	*	*	***	***	****
* Generally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Mobile homes may not be acceptable in these areas. Some outdoor activities might be adversely affected.					
** Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Outdoor activities may be adversely affected. Residential: Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.					
*** Generally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor activities are likely to be adversely affected.					
**** Unacceptable	New construction or development shall not be undertaken.					

Source: Based on General Plan Guidelines, Appendix C (2003), Figure 2 and Santa Clara County ALUC 1992 Land Use Plan, Table 1

Source:Comprehensive Land Use Plan Santa Clara County, Norman Y Mineta San José International Airport, May 25, 2011, Amended May 23, 2019.

City of East Palo Alto

Vista 2035 East Palo Alto General Plan

The City of East Palo Alto adopted the 2035 General Plan Final Version in March 2017. The Safety and Noise Chapter of the General Plan[4] provides goals and policies to reduce noise within the community. The goals and policies that apply to the proposed project are as follows:

Goal SN-6: Minimize the effects of noise through proper land use planning.

Intent: To ensure that new noise-sensitive land uses in the City are located in a compatible noise environment or adequately mitigated in order to provide a compatible exterior and interior noise environment.

> **Policy 6.1. Noise standards.** Use the Interior and Exterior Noise Standards (Table 10-1) for transportation noise sources. Use the City's Noise Ordinance for evaluating non-transportation noise sources when making planning and development decisions. Require that applicants demonstrate that the noise standards will be met prior to project approval.
>
> **Policy 6.2. Compatibility standards.** Utilize noise/land use compatibility standards and the Noise Ordinance as guides for future development decisions.
>
> **Policy 6.3. Noise control.** Provide noise controls measures, such as berms, walls, and sound attenuating construction in areas of new construction or rehabilitation.
>
> **Policy 6.4. Vibration impacts.** The City shall require new developments to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV will be used to minimize the potential for cosmetic damage to the building. A vibration limit of 0.30 in/sec PPV will be used to minimize the potential for cosmetic damage to buildings of normal conventional construction.
>
> **Policy 6.5. Airport-adjacent land uses.** Maintain the non-residential designation for land near the airport in order to prevent new noise-sensitive residential uses from being constructed in areas with excessive aircraft noise.

[4] City of East Palo Alto, *Vista 2035 East Palo Alto General Plan*, Safety and Noise Chapter, Adopted October 4, 2016. Final Version March 2017.

Table 10-1. Interior and Exterior Noise Standards		
Land Use	Noise Standards[1]	
	Interior[2, 3]	Exterior
Residential – Single family, multifamily, duplex, mobile home	CNEL 45 dB	CNEL 65 dB[4]
Residential – Transient lodging, hotels, motels, nursing home, hospitals	CNEL 45 dB	CNEL 65 dB[4]
Private offices, church sanctuaries, libraries, board rooms, conference rooms, theaters, auditoriums, concert halls, meeting halls, etc.	Leq(12) 45 dB(A)	-
Schools	Leq(12) 45 dB(A)	Leq(12) 67 dB(A)[5]
General offices, reception, clerical, etc.	Leq(12) 50 dB(A)	-
Bank lobby, retail store, restaurant, typing pool, etc.	Leq(12) 55 dB(A)	-
Manufacturing, kitchen, warehousing, etc.	Leq(12) 65 dB(A)	-
Parks, playgrounds	-	CNEL 65 dB[5]
Golf courses, outdoor spectator sports, amusement parks	-	CNEL 70 dB[5]

Notes:

1. CNEL: Community Noise Equivalent Level; Leq (12): The A-weighted equivalent sound level averaged over a 12-hour period (usually the hours of operation).
2. Noise standard with windows closed. Mechanical ventilation shall be provided per UBC requirements to provide a habitable environment.
3. Indoor environment excluding bathrooms, toilets, closets, and corridors.
4. Outdoor environment limited to rear yard of single family homes, multifamily patios, and balconies (with a depth of 6' or more) and common recreation areas.
5. Outdoor environment limited to playground areas, picnic areas and other areas of frequent human use.

Source: Title 24, California Code of Regulations

Goal SN-7: Minimize transportation- and non-transportation-related noise impacts, especially on noise-sensitive land uses.

Intent: To maintain and improve the noise environment at noise-sensitive land uses throughout the City.

Policy 7.1. Noise ordinance. Continually enforce and periodically review the City's Noise Ordinance for adequacy (including requiring construction activity to comply with established work schedule limits). Amend as needed to address community needs and development patterns.

Policy 7.2. CEQA acoustical analysis. Require an acoustical analysis to evaluate mitigation measures for noise-generating projects that are likely to cause the following criteria to be exceeded or to cause a significant adverse community response:

- Cause the L_{dn}/CNEL at noise-sensitive uses to increase by 3 dBA or more and exceed the "normally acceptable" level.

- Cause the L_{dn}/CNEL at noise-sensitive uses to increase by 5 dBA or more and remain "normally acceptable."

Policy 7.7. Site design review. Utilize site design review to identify potential noise impacts on new development, especially from nearby transportation sources. Encourage the use of noise barriers (walls, berms, or landscaping), setbacks and/or other buffers.

Policy 7.11. Construction noise. The City shall require that contractors use available noise suppression devices and techniques and limit construction hours near residential uses. Reasonable noise reduction measures shall be incorporated into the construction plan and implemented during all phases of construction activity to minimize the exposure of neighboring properties. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:

- Involve substantial noise-generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.

For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses. A typical construction noise logistics plan would include, but not be limited to, the following measures to reduce construction noise levels as low as practical:

- Limit construction activity to weekdays between 7:00 a.m. and 7:00 p.m. and Saturdays and holidays between 9:00 a.m. and 7:00 p.m., with no construction on Sundays;

- Utilize "quiet" models of air compressors and other stationary noise sources where such technology exists;

- Equip all internal combustion engine-driven equipment with mufflers, that are in good condition and appropriate for the equipment;

- Locate all stationary noise-generating equipment, such as air compressors and portable power generators, as far away as possible from adjacent land uses;

- Locate staging areas and construction material areas as far away as possible from adjacent land uses;

- Prohibit all unnecessary idling of internal combustion engines;

- If impact pile driving is proposed, multiple-pile drivers shall be considered to expedite construction. Although noise levels generated by multiple pile drivers would be higher than the noise generated by a single pile driver, the total duration of pile driving activities would be reduced;

- If impact pile driving is proposed, temporary noise control blanket barriers shall shroud pile drivers or be erected in a manner to shield the adjacent land uses. Such noise control blanket barriers can be rented and quickly erected;

- If impact pile driving is proposed, foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile. Pre-drilling foundation pile holes is a standard construction noise control technique. Pre-drilling reduces the number of blows required to seat the pile. Notify all adjacent land uses of the construction schedule in writing;

- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem are implemented.

- Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction.

City of East Palo Alto Municipal Code

Chapter 8.52, Noise Control, of the City's Municipal Code seeks to protect the citizens of East Palo Alto from unnecessary, excessive, and annoying noise; to maintain quiet in areas where noise levels are low; and to implement programs to reduce unacceptable noise. The regulations limit the amount of noise that may be created as measured at the exterior of any dwelling unit, school, hospital, church, or public library. Table 4 provides the Municipal Code's exterior noise standards. In addition, Chapter 8.52 limits the creation of noise that results in excessive noise levels within any dwelling unit. Table 5 provides the standards for interior noise in dwelling units. Exemptions to these standards are provided for activities such as special events and noise sources due to construction activities not taking place between 8:00 p.m. and 7:00 a.m.[5]

[5] City of East Palo Alto, 2017, *East Palo Alto Municipal Code*, Chapter 8.52, Noise Control.

TABLE 4 Receiving Land Use: Noise Level Standards for Single or Multiple Family Residence, School, Hospital, Church, or Public Library Properties

Category	Cumulative Number of Minutes in Any 1-Hour Time Period	Noise Level Standards, dBA	
		Daytime (7:00 am – 10:00 pm)	Nighttime (10:00 pm – 7:00 am)
1	30	55	50
2	15	50	55
3	5	65	60
4	1	70	60
5	0	75	70

Notes:

A. In the event the measured background noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted in 5 dBA increments so as to encompass the background noise level.

B. Each of the noise level standards specified above shall be reduced by 5 dBA for simple tone noises, consisting primarily of speech or music, or for recurring or intermittent impulsive noises.

C. If the intruding noise source is continuous and cannot reasonably be stopped for a period of time whereby the background noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the noise level standards in this table.

Source: City of East Palo Alto Municipal Code, 2017.

While Table 4 summarizes the levels provided in the Municipal Code for each category, the original Municipal Code document has two typos: Category 2 should be 60 dBA during daytime hours and 55 dBA during nighttime hours, and Category 4 should be 70 dBA during daytime hours and 65 dBA during nighttime hours. For any analysis involving these categories, the corrected levels are used.

Section 15.04.125 of the City's Municipal Code limits construction activity to the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 5:00 p.m. on Saturdays. No construction activity is allowed on Sundays or national holidays.

TABLE 5 Interior Noise Level Standards – Dwelling Unit

Category	Cumulative Number of Minutes in Any 1-Hour Time Period	Noise Level Standards, dBA	
		Daytime (7:00 am – 10:00 pm)	Nighttime (10:00 pm – 7:00 am)
1	5	45	40
2	1	50	45
3	0	55	50

Notes:

A. In the event the measured background noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted in 5 dBA increments so as to encompass the background noise level.

B. Each of the noise level standards specified above shall be reduced by 5 dBA for simple tone noises, consisting primarily of speech or music, or for recurring or intermittent impulsive noises.

C. If the intruding noise source is continuous and cannot reasonably be stopped for a period of time whereby the background noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the noise level standards in this table.

Source: City of East Palo Alto Municipal Code, 2017.

Existing Noise Environment

A noise measurement survey was completed to establish existing noise sources and noise levels in the Specific Plan area. There were several purposes for the noise measurements. Long-term (LT) measurements made hour-by-hour over a period of 24 hours or more provide information on how noise levels vary throughout the day and night and how noise levels may vary from day-to-day. A series of attended short-term (ST) measurement were also made that are useful for several purposes. The person attending the measurements can identify the noise sources that occur during the measurement and note the level of noise associated with identifiable events. This assists in quantitatively and qualitatively characterizing the noise environments along the major roadways and also in the quieter areas. CNEL is the metric used in East Palo Alto to characterize the 24-hour average noise exposure level. It is also important to know how noise levels vary within each hour of the day and night. For this purpose, standard acoustical descriptors $L_{eq,}$ L_{max}, L_1, L_{10}, L_{50}, L_{90}, and L_{min} were also measured and reported.

The study area is bounded by the Dumbarton Rail Line to the north, the Ravenswood Open Space Preserve and Palo Alto Baylands Nature Preserve to the east, Weeks and Runnymede Streets to the south, and University Avenue and Gloria Way to the west. Noise from transportation activity is the primary component of the noise environment in the Ravenswood area of East Palo Alto. Transportation corridors that traverse the area, such as State Route 109 (SR 109); major arterial roadways, such as University Avenue and Bay Road; and collector roadways, such as Clarke and Pulgas Avenues, are the predominant sources of environmental noise. Aircraft noise from the local Palo Alto Airport and San Francisco International Airport also contribute to the noise environment. Portions of the study area include industrial land uses, that further contribute to the noise environment.

The noise monitoring survey was completed between Wednesday, October 12, 2022 and Friday, October 14, 2022. Four long-term noise measurements (LT-1 through LT-4) and nine short-term (ten-minute duration) noise measurements (ST-1 through ST-9) were made within the study area. The measurement locations are shown in Figure 1.

Long-term noise measurement LT-1 was approximately 35 feet north of the centerline of Bay Road. Hourly average noise levels at this location typically ranged from 61 to 76 dBA L_{eq} during the day and from 51 to 66 dBA L_{eq} at night. The average community noise equivalent level was 70 dBA CNEL on Thursday, October 13, 2022. Long-term noise measurement LT-2 was approximately 35 feet east of the centerline of University Avenue. Hourly average noise levels at this location typically ranged from 71 to 77 dBA L_{eq} during the day and from 62 to 72 dBA L_{eq} at night. The average community noise equivalent level was 77 dBA CNEL on Thursday, October 13, 2022. Long-term noise measurement LT-3 was approximately 95 feet east of the centerline of Illinois Street. Hourly average noise levels at this location typically ranged from 50 to 63 dBA L_{eq} during the day and from 38 to 52 dBA L_{eq} at night. The average community noise equivalent level was 58 dBA CNEL on Thursday, October 13, 2022. Long-term noise measurement LT-4 was conducted approximately 55 feet east of the centerline of University Avenue. Hourly average noise levels at this location typically ranged from 64 to 72 dBA L_{eq} during the day and from 55 to 66 dBA L_{eq} at night. The average community noise equivalent level was 71 dBA CNEL on Thursday,

October 13, 2022. The daily trends in noise levels measured at LT-1 through LT-4 are shown in Figures A1 through A12 in the Appendix.

FIGURE 1 Project Site and Surrounding Area

Source: Google Earth, Modified by Illingworth & Rodkin, Inc. December 2022

Short-term noise measurement ST-1 was made at the end of Rutgers Street by the bicycle path on Wednesday, October 12, 2022, starting at 11:20 a.m. This location was selected to quantify background ambient noise levels at the northern edge of the study area. The 10-minute average noise level measured at this location was 49 dBA L_{eq}. Aircraft were the main sources of noise in the area and produced maximum noise levels ranging from 51 to 61 dBA L_{max}. A single vehicle pass-by on Tulane Avenue produced maximum noise levels up to 48 dBA L_{max}, and nearby landscaping activities produced maximum noise levels ranging from 40 to 60 dBA L_{max}. Short-term noise data are summarized in Table 6.

Short-term noise measurement ST-2 was made at the end of Forham Street, near the Ravenswood Open Space Preserve on Wednesday, October 12, 2022, starting at 11:40 a.m. This location was selected to quantify ambient noise levels around the northeast corner of the study area. The 10-minute average noise level measured at this location was 48 dBA L_{eq}. Aircraft were the main source of noise in the area and produced maximum noise levels ranging from 48 to 58 dBA L_{max}. There were no vehicle pass-bys during the measurement. Nearby power tools produced maximum noise levels up to 54 dBA L_{max}.

Short-term noise measurement ST-3 was made at the end of Stevens Avenue near the Ravenswood Open Space Preserve on Wednesday, October 12, 2022, starting at 12:00 p.m. This location was selected to quantify ambient noise levels at the east side of the study area. The 10-minute average noise level measured at this location was 48 dBA L_{eq}. Vehicle pass-bys and aircraft were the main

sources of noise in the area and produced maximum noise levels ranging from 48 to 67 dBA L_{max}, and from 49 to 55 dBA L_{max}, respectively.

Short-term noise measurement ST-4 was made across from 2524 Pulgas Avenue on Wednesday, October 12, 2022, over two ten-minute periods starting at 12:20 p.m. and concluding at 12:40 p.m. This location was selected to quantify ambient noise levels around the industrial zones of the study area. The first 10-minute average noise level measured at this location was 71 dBA L_{eq}. A flatbed truck was loading a dumpster during the measurement. At approximately 150 feet, the truck generated noise levels up to 95 dBA L_{max}. Eighteen vehicle pass-bys produced maximum noise levels ranging from 65 to 73 dBA, and a truck pass-by produced maximum noise levels up to 75 dBA L_{max}. Aircraft also contributed to the noise environment, producing maximum noise levels ranging from 61 to 68 dBA L_{max}. An industrial saw approximately 500 feet to the west produced maximum noise levels ranging from 55 to 62 dBA L_{max}. The second 10-minute average noise level measured at this location was 62 dBA L_{eq}. 20 vehicles passed by during the measurement, and aircraft, and industrial sawing also contributed to the noise environment.

Short-term noise measurement ST-5 was made at 1950 Bay Road approximately 50 feet from the roadway centerline on Wednesday, October 12, 2022, starting at 12:50 p.m. This location was selected to quantify ambient noise levels along Bay Road. The 10-minute average noise level measured at this location was 60 dBA L_{eq}. Industrial machinery noise approximately 200 feet to the north was the main source of noise in the area and produced maximum noise levels ranging from 46 to 53 dBA L_{max}. Eleven vehicle pass-bys produced maximum noise levels ranging from 55 to 66 dBA, and a truck pass-by produced maximum noise levels up to 74 dBA L_{max}. Aircraft also contributed to the noise environment, producing maximum noise levels ranging from 65 to 74 dBA L_{max}.

Short-term noise measurement ST-6 was made at the playground next to 621 Montage Circle on Wednesday, October 12, 2022, starting at 1:10 p.m. This location was selected to quantify ambient noise levels in the neighborhood south of Bay Road, located about 330 feet to the north. The 10-minute average noise level measured at this location was 51 dBA L_{eq}. Background traffic noise produced maximum noise levels up to 44 dBA L_{max}. Aircraft also contributed to the noise environment, producing maximum noise levels ranging from 44 to 67 dBA L_{max}.

Short-term noise measurement ST-7 was made near the end of Weeks Street, approximately 25 feet south of the roadway centerline, on Friday, October 14, 2022, starting at 10:00 a.m. This location was selected to quantify ambient noise levels in the neighborhood in the southeast corner of the study area. The 10-minute average noise level measured at this location was 46 dBA L_{eq}. Background traffic noise along Pulgas Avenue produced maximum noise levels ranging from 38 to 45 dBA L_{max}, while a single vehicle pass-by on Weeks Street produced maximum noise levels up to 62 dBA L_{max}. Aircraft also contributed to the noise environment, producing maximum noise levels ranging from 44 to 66 dBA L_{max}.

Short-term noise measurement ST-8 was made near 2370 Cooley Avenue, approximately 32 feet east of the roadway centerline and 145 feet east of the University Avenue centerline on Friday, October 14, 2022 starting at 10:20 a.m. This location was selected to quantify ambient noise levels in the neighborhood in the southwest corner of the study area. The 10-minute average noise level

measured at this location was 60 dBA L_{eq}. One hundred fifty-seven vehicles along University Avenue and 13 vehicles along Cooley Avenue produced maximum noise levels ranging from 55 to 67 dBA L_{max}, Two jets also contributed to the noise environment, producing maximum noise levels ranging from 61 to 62 dBA L_{max}.

Short-term noise measurement ST-9 was made near 1586 Bay Road, approximately 45 feet south of the roadway centerline on Friday, October 14, 2022, starting at 10:40 a.m. This location was selected to quantify ambient noise levels in the neighborhood in the southwest corner of the study area, near Bay Road. The 10-minute average noise level measured at this location was 61 dBA L_{eq}. Sixty-four vehicles along Bay Road produced maximum noise levels ranging from 57 to 73 dBA L_{max}, A truck and a bus produced maximum noise levels up to 67 and 69 dBA L_{max}, respectively.

TABLE 6 Summary of Short-Term Noise Measurements (dBA)

Noise Measurement Location	L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}
ST-1: End of Rutgers Street (10/12/2022, 11:20 a.m. - 11:30 a.m.)	61	58	53	46	41	49
ST-2: End of Fordham Street (10/12/2022, 11:40 a.m. - 11:50 a.m.)	59	58	52	43	39	48
ST-3: End of Stevens Avenue (10/12/2022, 12:00 p.m. - 12:10 p.m.)	67	56	51	43	40	48
ST-4a: Across from 2524 Pulgas Avenue (10/12/2022, 12:20 p.m. - 12:30 p.m.)	95	80	70	60	55	71
ST-4b: Across from 2524 Pulgas Avenue (10/12/2022, 12:30 p.m. - 12:40 p.m.)	79	71	65	57	49	62
ST-5: 1950 Bay Road (10/12/2022, 12:50 p.m. - 1:00 p.m.)	75	72	64	52	48	60
ST-6: Playground near 621 Montage Circle (10/12/2022, 1:10 p.m. - 1:20 p.m.)	67	64	54	43	41	51
ST-7: End of Weeks Street (10/14/2022, 10:00 a.m. - 10:10 a.m.)	66	60	45	37	34	46
ST-8: 2370 Cooley Avenue (10/14/2022, 10:20 a.m. - 10:30 a.m.)	67	66	64	60	52	60
ST-9: 1586 Bay Road (10/14/2022, 10:40 a.m. - 10:50 a.m.)	73	69	64	59	55	61

Future Noise Environment

SoundPLAN Version 8.2, a three-dimensional ray-tracing computer program, was used to develop the traffic noise contours calculated for the existing (2020) and future (2040) traffic conditions along major roadways in the plan area. Calculations accounted for the source of noise (traffic), the frequency spectra of the noise source, traffic speeds, vehicle mix information and the topography of the area. In order to provide a credible worst-case assessment of existing and future traffic noise conditions throughout the plan area, the modeling did not incorporate existing buildings or barriers, including centerline K-rails on the expressway medians, into the calculations. The modeling also

assumed a hard ground surface for the plan area since it consists of mostly paved roads and buildings and other features commonly found in built environments. The geometric data used to create the model were based on GIS information provided by the City of East Palo Alto. Existing (2020) and future (2040) peak hour traffic data provided by the traffic consultants and observed travel speeds were input into the model for local roadways. Since the plan area consists of residential and light industrial uses, a truck mix of 1% to 2% was used along the local roadways. The predicted noise levels were then compared to measured noise levels for calibration purposes and adjustments were made as necessary. Contours presented in this report represent the primary traffic noise sources in the plan area. Localized sources of noise, such as industrial plants and other stationary equipment or operations, were not included in the model because these sources only affect limited areas. Figure 2 provides the existing (2020) traffic noise contour for the plan area, Figures 3 and 4 provide the traffic contours for the worst-case scenario i.e., the 2040 buildout scenario #2 (3.35 million square feet) with and without the loop road, respectively.

Table 7 summarizes the existing and future CNEL noise levels, as measured at a distance of 75 feet from the centerline of the roadway. The existing and future CNEL noise levels are adjusted based on existing measurements, modeled traffic noise levels and airport noise contours presented in Figure 5.

Palo Alto Airport is located approximately 0.6 miles southeast of the plan area, and noise exposure information is developed and reported in the Comprehensive Land Use Plan (CLUP).[6] Existing conditions are best represented by the 2022 noise exposure map that was adopted in 2018 and is shown in Figure 5. The western portion of the plan area would fall outside the 65 dBA CNEL contour line but within the 55 and 60 dBA CNEL noise contours.

[6] Santa Clara County Airport Land Use Commission, "Comprehensive Land Use Plan Santa Clara County: Palo Alto Airport," November 19, 2018 and amended November 18, 2020.

FIGURE 2 Ravenswood/4 Corners Specific Plan Area – Existing (2020) Traffic Noise Contours

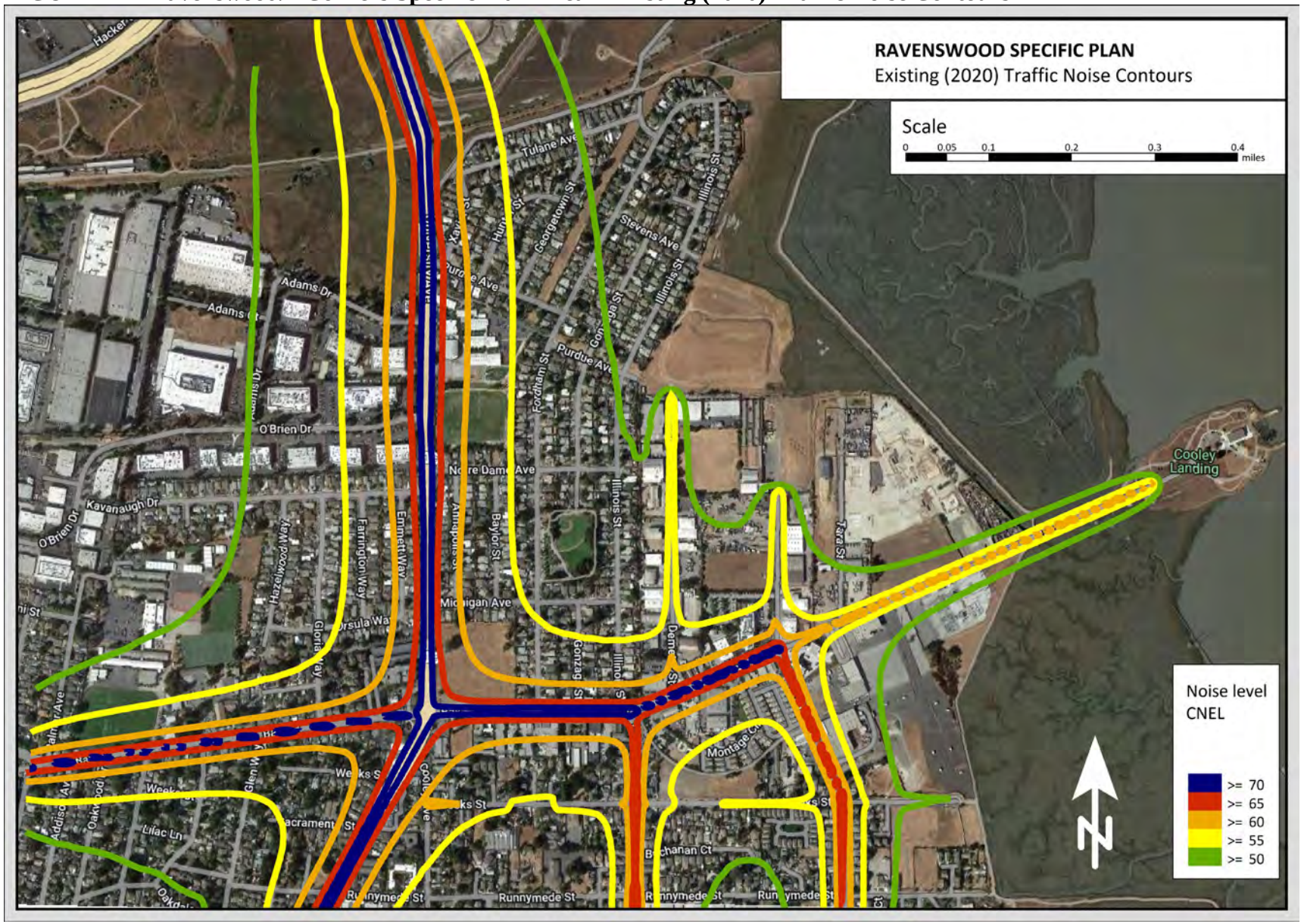


FIGURE 3 Ravenswood/4 Corners Specific Plan Area – Scenario #2 (2040) No Loop Road Traffic Noise Contours

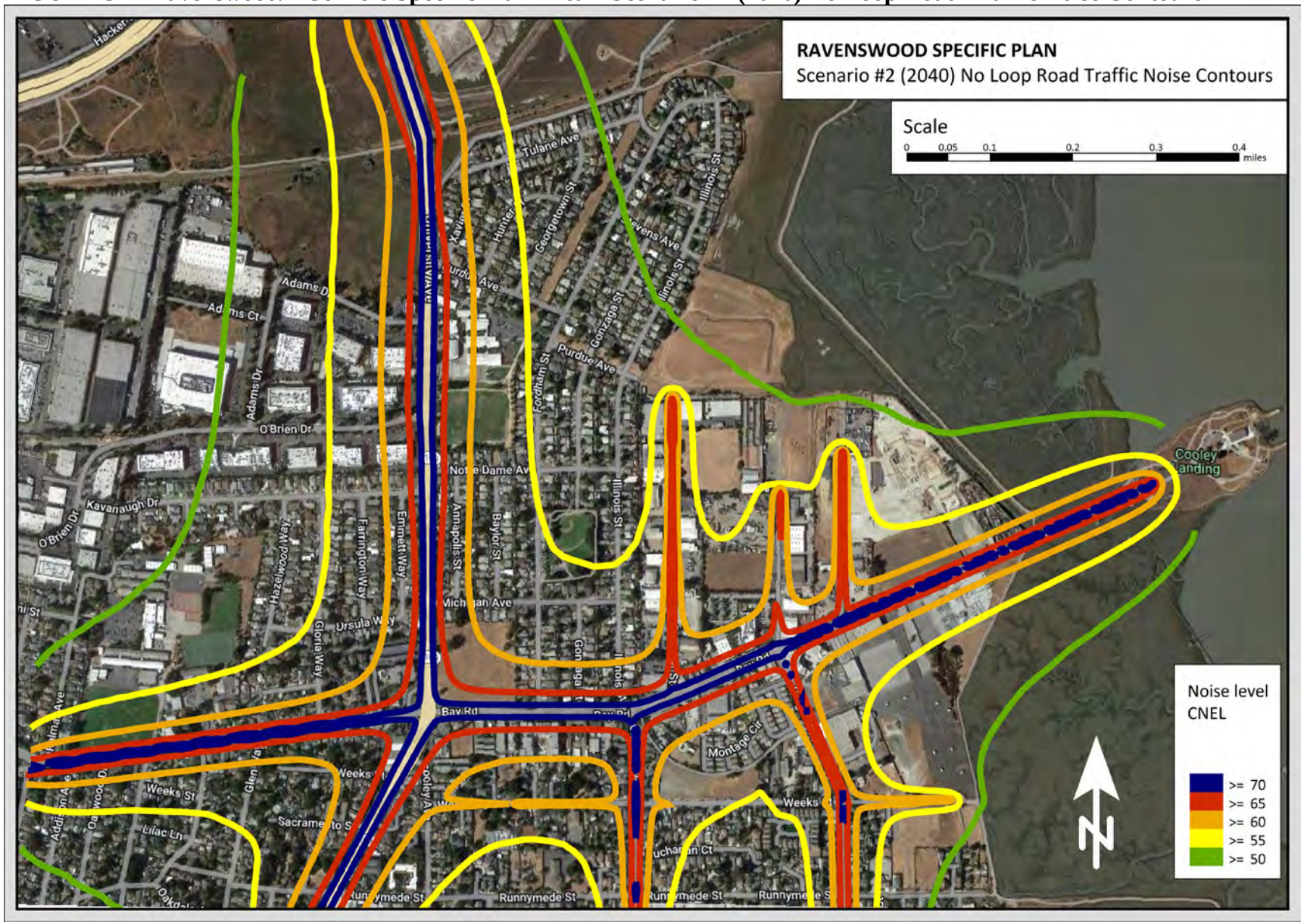


FIGURE 4 Ravenswood/4 Corners Specific Plan Area – Scenario #2 (2040) With Loop Road Traffic Noise Contours

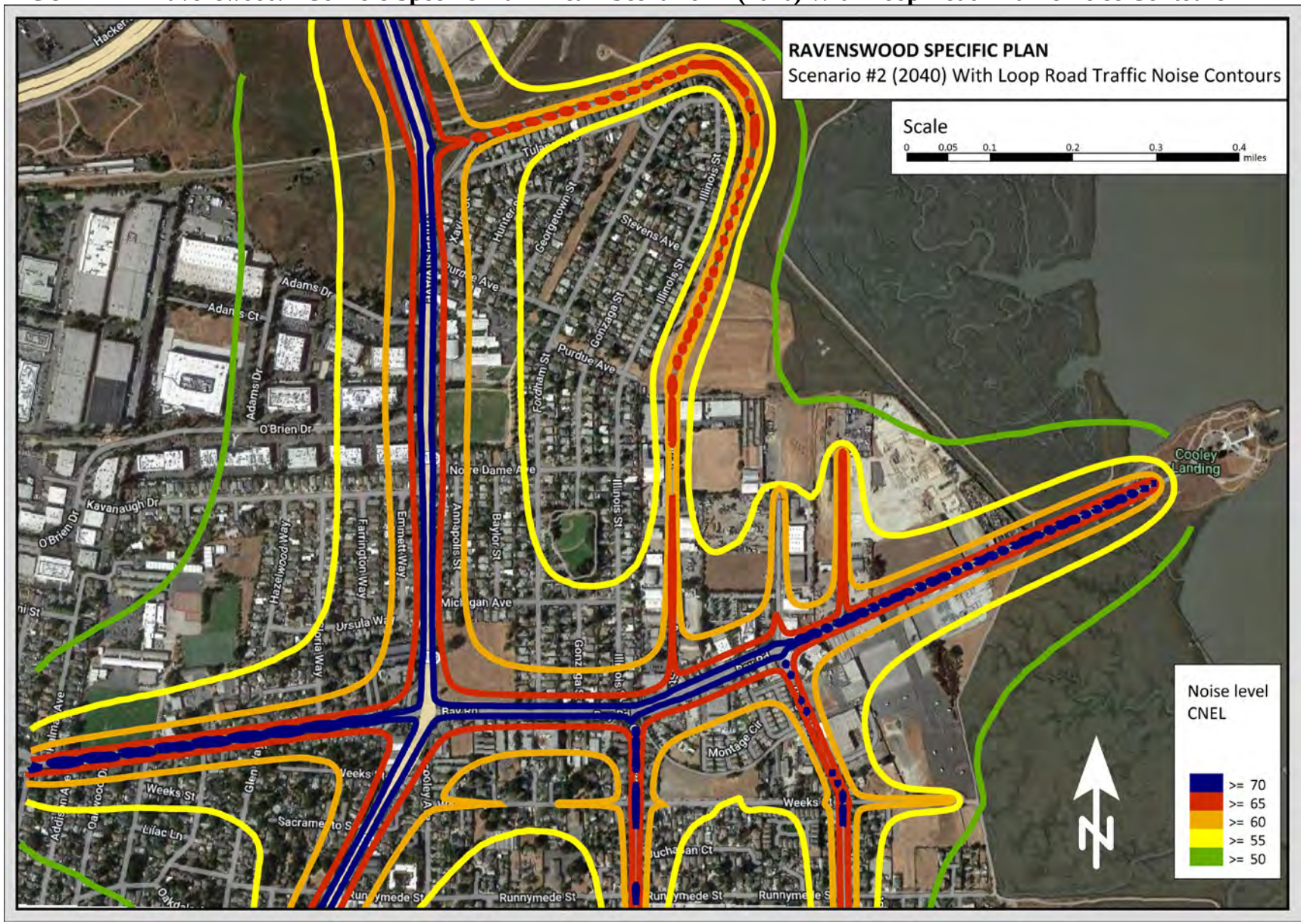
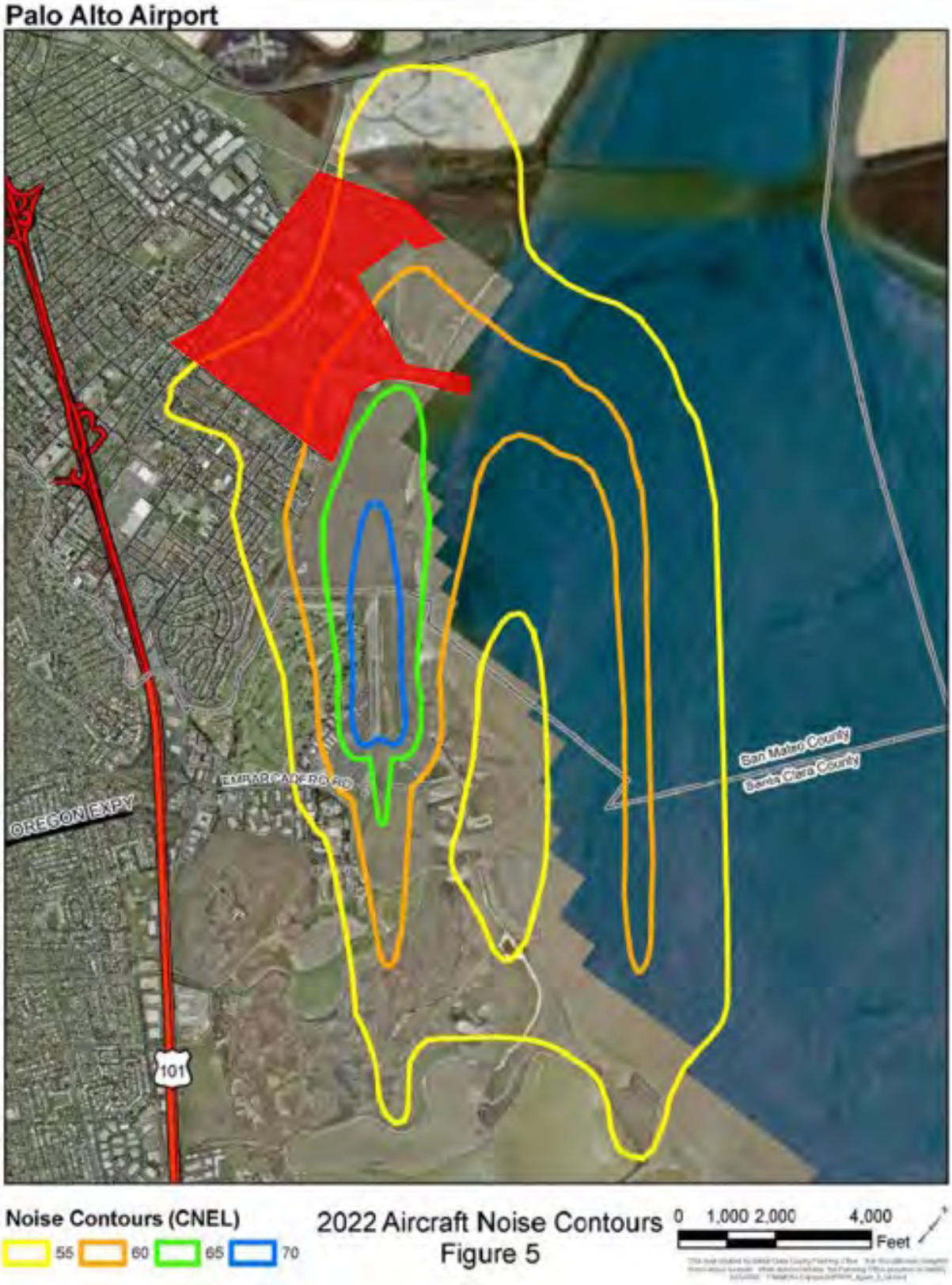


TABLE 7 Existing and Future Modeled Noise Levels Along Surrounding Roadways

Roadway	Segment	CNEL at 75 feet from the Roadway Centerline, dBA					
		Existing	2040 "No project" Scenario with Loop Road	2040 Scenario #1 No Loop Road	2040 Scenario #1 With Loop Road	2040 Scenario #2 No Loop Road	2040 Scenario #2 With Loop Road
University Avenue	Bayfront Expressway to Loop Road (future)	66	66	67	67	67	67
	Loop Road to Purdue Ave.	66	66	66	66	66	66
	Purdue Ave to O Brian Dr	66	67	67	67	67	67
	O Brian Dr to Notre Dame Ave	66	66	67	66	67	66
	Notre Dame Ave to Bay Road	64	65	65	65	65	65
	Bay Road to Runnymede St	64	65	65	65	66	66
	South of Runnymede St	64	65	66	66	66	66
Bay Road	East of Newbridge St	62	63	63	63	64	64
	University Ave to Clarke Ave	64	66	**67**	66	**67**	**67**
	Clarke Ave to Pulgas Ave	64	65	**68**	**67**	**68**	**67**
	East of Pulgas Ave	62	63	65	65	65	65
Pulgas Ave	North of Bay Road	61	61	62	62	62	62
	Bay Road to Weeks St	62	62	63	63	63	63
	Weeks St to Runnymede St	61	61	62	62	62	62
	South of Runnymede St	61	61	62	62	62	62
Clarke Ave	Bay Road to Weeks St	61	62	63	63	64	63
	Weeks St to Runnymede St	60	61	62	61	62	61
	South of Runnymede St	60	60	61	61	61	61
Demeter St	North of Bay Road	57	58	60	59	60	59
Tara St	North of Bay Road	61	62	62	62	63	62

Roadway	Segment	CNEL at 75 feet from the Roadway Centerline, dBA					
		Existing	**2040 "No project" Scenario with Loop Road**	**2040 Scenario #1 No Loop Road**	**2040 Scenario #1 With Loop Road**	**2040 Scenario #2 No Loop Road**	**2040 Scenario #2 With Loop Road**
Weeks St	West of Clarke Ave	59	60	60	60	60	60
	Clarke Ave to Pulgas Ave	59	59	60	60	60	60
	East of Pulgas Ave	62	62	63	63	63	63
Loop Road	East of University Ave	58	60	58	60	58	60
	North of Demeter St	58	60	58	60	58	60

FIGURE 5 2022 Noise Contours for Palo Alto Airport



PLAN CONSISTENCY ANALYSIS

This section summarizes the analysis of the land use compatibility of the proposed development within the Plan Area with respect to the future noise environment. Recommendations are made to ensure that future developments within the Plan Area are not exposed to excessive noise levels.

Noise and Land Use Compatibility

The Specific Plan proposes to develop noise-sensitive mixed-use residential uses along major and local roadways and adjacent to proposed industrial uses. The Specific Plan also proposes to develop Light Industrial, R&D/Industrial and Civic Community Service uses adjacent to existing and proposed residential areas with and adjacent to the Plan Area. Much of the mixed-use residential development proposed in the Specific Plan is expected to include retail or commercial uses on the ground floor with residences located on the upper stories.

The City of East Palo Alto's General Plan sets forth policies with the goal of minimizing the impact of noise on people through noise reduction and suppression techniques and through appropriate land use policies in the City of East Palo Alto. The applicable General Plan policies were presented in detail in the Regulatory Background section and are summarized below for the proposed project:

- The City's acceptable exterior noise level standard is 65 dBA CNEL or less for the proposed residential uses.

- The City's acceptable interior noise level standard is 45 dBA CNEL or less for the proposed residential land uses.

- The City's acceptable interior noise level standard is 45 dBA $L_{eq(12)}$ or less for the proposed private offices and conference rooms over a 12-hour period during operational hours.

- The City's acceptable interior noise level standard is 50 dBA $L_{eq(12)}$ or less for the proposed general offices, reception, and clerical areas over a 12-hour period during operational hours.

- The City's acceptable interior noise level standard is 55 dBA $L_{eq(12)}$ or less for the proposed banks, retail, and restaurant uses over a 12-hour period during operational hours.

- The City's acceptable interior noise level standard is 65 dBA $L_{eq(12)}$ or less for the proposed manufacturing and warehouse uses over a 12-hour period during operational hours.

- The Cal Green Code standards specify an interior noise environment attributable to exterior sources not to exceed an hourly equivalent noise level ($L_{eq\ (1\text{-}hr)}$) of 50 dBA in occupied areas of nonresidential uses during any hour of operation.

Noise levels in the Plan Area were measured and calculated using SoundPLAN Version V8.2. The estimated noise level increases along each roadway segment are summarized in Table 7, and the cumulative plus project noise contours are shown in Figure 4.

Future Exterior Noise Environment

Specific locations for future development projects are unknown at this time. However, distances to the 65 dBA CNEL threshold for residential uses were estimated along each roadway segment based on the future exterior noise levels that are summarized in Table 8 and 9.

Table 8 presents the distances to the 70, 65 and 60 dBA CNEL contours for the worst-case scenario (Scenario #2) without the Loop Road while Table 9 shows the same with the Loop Road.

Future exterior noise levels at a distance of 75 feet from the centerline of the primary roadways within the Ravenswood Plan Area would typically range from 58 dBA CNEL to 67 dBA CNEL for the no Loop Road worst-case scenario (Scenario #2) and from 59 dBA CNEL to 67 dBA CNEL for the worst-case scenario (Scenario #2) with the Loop Road.

TABLE 8 2040 General Plan Buildout Plus Proposed Project (Scenario #2) Without Loop Road Traffic Noise Contour Distances within the Plan Area

Roadway	Segment	Distance from Centerline to Traffic Noise Contour, feet		
		70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
University Avenue	Bayfront Expressway to Loop Road (future)	<50 feet	120 feet	380 feet
	Loop Road to Purdue Ave.	<50 feet	100 feet	200 feet
	Purdue Ave to O Brian Dr	<50 feet	120 feet	380 feet
	O Brian Dr to Notre Dame Ave	<50 feet	120 feet	380 feet
	Notre Dame Ave to Bay Road	<50 feet	80 feet	150 feet
	Bay Road to Runnymede St	<50 feet	100 feet	200 feet
	South of Runnymede St	<50 feet	100 feet	200 feet
Bay Road	East of Newbridge St	<50 feet	60 feet	130 feet
	University Ave to Clarke Ave	<50 feet	120 feet	380 feet
	Clarke Ave to Pulgas Ave	<50 feet	120 feet	380 feet
	East of Pulgas Ave	<50 feet	80 feet	150 feet
Pulgas Ave	North of Bay Road	<50 feet	<50 feet	120 feet
	Bay Road to Weeks St	<50 feet	50 feet	150 feet

Roadway	Segment	Distance from Centerline to Traffic Noise Contour, feet		
		70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
	Weeks St to Runnymede St	<50 feet	<50 feet	120 feet
	South of Runnymede St	<50 feet	<50 feet	120 feet
Clarke Ave	Bay Road to Weeks St	<50 feet	60 feet	130 feet
	Weeks St to Runnymede St	<50 feet	<50 feet	120 feet
	South of Runnymede St	<50 feet	<50 feet	100 feet
Demeter St	North of Bay Road	<50 feet	<50 feet	80 feet
Tara St	North of Bay Road	<50 feet	50 feet	150 feet
Weeks St	West of Clarke Ave	<50 feet	<50 feet	80 feet
	Clarke Ave to Pulgas Ave	<50 feet	<50 feet	80 feet
	East of Pulgas Ave	<50 feet	50 feet	150 feet
Loop Road	East of University Ave	<50 feet	<50 feet	50 feet
	North of Demeter St	<50 feet	<50 feet	50 feet

TABLE 9 2040 Buildout Plus Proposed Project (Scenario #2) With Loop Road Traffic Noise Contour Distances within the Plan Area

Roadway	Segment	Distance from Centerline to Traffic Noise Contour, feet		
		70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
University Avenue	Bayfront Expressway to Loop Road (future)	<50 feet	120 feet	380 feet
	Loop Road to Purdue Ave.	<50 feet	100 feet	200 feet
	Purdue Ave to O Brian Dr	<50 feet	120 feet	380 feet
	O Brian Dr to Notre Dame Ave	<50 feet	100 feet	200 feet
	Notre Dame Ave to Bay Road	<50 feet	80 feet	150 feet
	Bay Road to Runnymede St	<50 feet	100 feet	200 feet
	South of Runnymede St	<50 feet	100 feet	200 feet
Bay Road	East of Newbridge St	<50 feet	60 feet	130 feet
	University Ave to Clarke Ave	<50 feet	120 feet	380 feet
	Clarke Ave to Pulgas Ave	<50 feet	120 feet	380 feet
	East of Pulgas Ave	<50 feet	80 feet	150 feet
Pulgas Ave	North of Bay Road	<50 feet	<50 feet	120 feet
	Bay Road to Weeks St	<50 feet	50 feet	150 feet
	Weeks St to Runnymede St	<50 feet	<50 feet	120 feet
	South of Runnymede St	<50 feet	<50 feet	120 feet
Clarke Ave	Bay Road to Weeks St	<50 feet	50 feet	150 feet
	Weeks St to Runnymede St	<50 feet	<50 feet	100 feet
	South of Runnymede St	<50 feet	<50 feet	100 feet
Demeter St	North of Bay Road	<50 feet	<50 feet	60 feet
Tara St	North of Bay Road	<50 feet	<50 feet	120 feet

Roadway	Segment	Distance from Centerline to Traffic Noise Contour, feet		
		70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
Weeks St	West of Clarke Ave	<50 feet	<50 feet	80 feet
	Clarke Ave to Pulgas Ave	<50 feet	<50 feet	80 feet
	East of Pulgas Ave	<50 feet	50 feet	150 feet
Loop Road	East of University Ave	<50 feet	<50 feet	80 feet
	North of Demeter St	<50 feet	<50 feet	80 feet

Future Interior Noise Environment

Residential Uses

Standard residential construction provides approximately 15 dBA of exterior-to-interior noise reduction, assuming the windows are partially open for ventilation. Where exterior noise levels range from 60 to 65 dBA CNEL, the inclusion of adequate forced-air mechanical ventilation is often the method selected to reduce interior noise levels to acceptable levels by closing the windows to control noise. Where noise levels exceed 65 dBA CNEL, forced-air mechanical ventilation systems and sound-rated construction methods are normally required. Such methods or materials may include a combination of smaller window and door sizes as a percentage of the total building façade facing the noise source, sound-rated windows and doors, sound-rated exterior wall assemblies, and mechanical ventilation so windows may be kept closed at the occupant's discretion.

The setback distances in Tables 8 and 9, to meet the exterior noise limit of 65 dBA CNEL would also meet the interior noise limit of 45 dBA CNEL, assuming standard residential construction materials. Buildings within the setback distances to the 65 dBA CNEL contour would require adequate forced-air mechanical ventilation with standard construction materials to meet 45 dBA CNEL within residential units. At or within the 70 dBA CNEL contour distance, sound-rated construction materials would be required to meet the 45 dBA CNEL limit.

Commercial, Office, and Industrial Uses

Standard construction materials for commercial, office, and industrial uses would provide about 25 dBA of noise reduction in interior spaces. The inclusion of adequate forced-air mechanical ventilation systems is normally required so that windows may be kept closed at the occupant's discretion and would provide an additional 5 dBA reduction. The standard construction materials in combination with forced-air mechanical ventilation would satisfy the daytime threshold of 50 dBA $L_{eq(1\text{-}hr)}$ and the City's thresholds of 45 to 65 dBA $L_{eq(12)}$ at most commercial, office, and industrial uses.

Spaces where lower noise levels would be desired, such as private offices and conference rooms, may benefit from additional noise control in order to meet a lower, more desirable interior noise level. Additional noise control could be accomplished by selecting higher sound-rated windows (STC 34 or greater along exterior façades).

Recommendations to Reduce Future Exterior and Interior Noise Levels

When project-level development information, such as site plans, building elevations, floor plans, and the position of buildings and outdoor use areas within the Plan Area are known, site-specific project-level noise studies should be conducted to confirm the recommendations for exterior and interior noise reduction methods for both residential and nonresidential uses. An acoustical study shall be conducted when an application is received for a development project that could be exposed to noise greater than that deemed acceptable by the maximum noise levels specified in Table 10-1 of the City of East Palo Alto's General Plan for any given land use proposed on the site. The study shall determine compliance with the noise and land use compatibility standards, identify potential noise impacts, and propose site-specific measures to reduce exposure to exterior and interior noise levels that exceed maximum permissible levels.

The Specific Plan may also implement development of new residential uses adjacent to or within the same building as noise-generating commercial or retail uses. Noise levels resulting from heating, ventilating, and air conditioning equipment, entertainment, etc., from such could exceed the City's noise ordinance limits. The Specific Plan also proposes to develop Light Industrial, R&D/Industrial and Civic Community Service uses adjacent to existing and proposed residential areas. Noise levels resulting from the operation of these new uses could result in noise levels exceeding the City's noise element and/or ordinance limits at these existing residential uses. Noise mitigation, such as proper facility or site design, operational limits, and/or sound barriers, may be required to achieve the comply with City noise standards where these adjacencies occur.

> **General Plan Policy 7.7. Site design review.** Utilize site design review to identify potential noise impacts on new development, especially from nearby transportation sources. Encourage the use of noise barriers (walls, berms, or landscaping), setbacks and/or other buffers.

A project-specific acoustical analysis shall be prepared, in compliance with State Building Codes and City noise standards, to ensure that the design incorporates controls to reduce interior noise levels to 45 dBA CNEL or lower within the residential units and to 45 to 65 dBA $L_{eq(12)}$ or lower, depending on the specific land use, within nonresidential interiors. The project applicant shall conform with any special building construction techniques requested by the City's Building Department, which may include sound-rated windows and doors, sound-rated wall constructions, and acoustical caulking.

The following general recommendations shall be considered to reduce exterior noise levels to meet the normally acceptable thresholds of 65 dBA CNEL at residential uses:

- When developing project site plans, locate noise-sensitive outdoor use areas away from major roadways or other significant sources of noise. Shield noise-sensitive spaces with

buildings or noise barriers to reduce exterior noise levels. The final detailed design of the heights and limits of proposed noise barriers shall be completed at the time that the final site and grading plans are submitted.

If the 45 dBA CNEL or 45 to 65 dBA $L_{eq(12)}$ threshold, depending on the proposed use, would not be met, other site-specific measures, such as increasing setbacks of the buildings from the adjacent roadways, using shielding by other buildings or noise barriers to reduce noise levels, implementing additional sound treatments to the building design, etc. shall be considered to reduce interior noise levels to meet the State and City thresholds.

NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

The following criteria were used to evaluate the significance of environmental noise resulting from the project:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

(b) Generation of excessive groundborne vibration or groundborne noise levels;

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

Impact 1a: **Temporary Construction Noise.** Existing residential land uses located within 500 feet of the project site and commercial uses located within 200 feet of the project site would be exposed to a temporary increase in ambient noise levels due to project construction activities for a period exceeding one year. **This is a significant impact.**

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time.

Section 15.04.125 of the City's Municipal Code limits construction activities to between 7:00 a.m. and 6:00 p.m. on weekdays and to between 9:00 a.m. and 5:00 p.m. on Saturdays. Construction activities are prohibited on Sundays and national holidays. During these allowable hours, construction noise would be exempt from the City's exterior and interior noise level standards at single- or multi-family residences, schools, hospitals, churches, and public libraries. Additionally,

Policy 7.11 of the City's General Plan states that a significant construction noise impact would occur if substantial noise-generating construction activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) occurred within 500 feet of residential uses or 200 feet of commercial or office uses for more than 12 months. Further, large complex projects would require a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints to be in place prior to the start of construction and to be implemented during construction to reduce noise impacts on neighboring residents and other uses.

While the City of East Palo Alto does not establish noise level thresholds for construction activities, this analysis uses the noise limits established by the Federal Transit Administration (FTA) to identify the potential for impacts due to substantial temporary construction noise. The FTA identifies construction noise limits in the *Transit Noise and Vibration Impact Assessment Manual*.[7] During daytime hours, an exterior threshold of 80 dBA L_{eq} shall be enforced at residential land uses and 90 dBA L_{eq} shall be enforced at commercial and industrial land uses.

Major noise-generating construction activities associated with Area Plan would typically include removal of existing structures, site grading and excavation, installation of utilities, the construction of building foundations, cores, and shells, paving, and landscaping. Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. While specific project information is unknown at this time, the construction of building foundations for high-rise building may require impact or vibratory pile driving activities to support the structure, which would generate high noise levels. Site grading, excavation activities, the operation of heavy construction equipment, and the arrival/departure of heavy-duty trucks would also generate high noise levels, as these phases often require the simultaneous use of multiple pieces of heavy equipment such as dozers, excavators, scrapers, and loaders.

Typical hourly average construction generated noise levels are about 81 to 88 dBA L_{eq}, measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.). Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor. Shielding by buildings or terrain often result in lower construction noise levels at distant receptors. Lower noise levels result from building construction activities when these activities move indoors, and less heavy equipment is required to complete the tasks. Typical construction noise levels at a distance of 50 feet are shown in Tables 10 and 11. Table 10 shows the average noise level ranges, by construction phase, and Table 11 shows the maximum noise level ranges for different construction equipment.

7 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

TABLE 10 Typical Ranges of Construction Noise Levels at 50 Feet, L_{eq} (dBA)

	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84

I - All pertinent equipment present at site.
II - Minimum required equipment present at site.

Source: U.S.E.P.A., Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

TABLE 11 Construction Equipment, 50-foot Noise Emission Limits

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor[3]	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes: [1] Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

[2] Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

[3]Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

Temporary construction noises are disturbances that are necessary for the construction or repair of buildings and structures in urban and rural areas. Reasonable regulation of the hours of construction, as well as regulation of the arrival and operation of heavy equipment and the delivery of construction materials, are necessary to protect the health and safety of persons, promote the general welfare of the community, and maintain the quality of life. Limiting the hours when construction can occur to daytime hours is often a simple method to reduce the potential for noise impacts. In areas immediately adjacent to construction, controls such as constructing temporary noise barriers and utilizing "quiet" construction equipment can also reduce the potential for noise impacts.

Construction activities within the Plan Area will be conducted in accordance with the provisions of the City's Municipal Code, which limits temporary construction work to between 7:00 a.m. and 6:00 p.m. on weekdays and between 9:00 a.m. and 5:00 p.m. on Saturdays. Construction activity is not permitted on Sundays or national holidays. Further, construction activities will be conducted in accordance with the City of East Palo Alto's General Plan, which states that if substantial noise-generating construction activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) occur within 500 feet of residential uses or 200 feet of commercial or office uses for more than 12 months, construction noise would be considered significant. Large complex projects within the Plan Area would require a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints to be in place prior to the start of construction and to be implemented during construction to reduce noise impacts on neighboring residents and other uses. A typical construction noise logistics plan would include, but not be limited to, the following measures to reduce construction noise levels as low as practical:

- Limit construction activity to weekdays between 7:00 a.m. and 7:00 p.m. and Saturdays and holidays between 9:00 a.m. and 7:00 p.m., with no construction on Sundays;

- Limit combined construction noise levels (levels from all construction equipment used per phase) to an hourly average of 80 dBA Leq for residential receptors and to an hourly average of 90 dBA Leq for commercial receptors;

- Utilize "quiet" models of air compressors and other stationary noise sources where such technology exists;

- Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment;

- Locate all stationary noise-generating equipment, such as air compressors and portable power generators, as far away as possible from adjacent land uses;

- Locate staging areas and construction material areas as far away as possible from adjacent land uses;

- Prohibit all unnecessary idling of internal combustion engines;

- If impact pile driving is proposed, multiple-pile drivers shall be considered to expedite construction. Although noise levels generated by multiple pile drivers would be higher than the noise generated by a single pile driver, the total duration of pile driving activities would be reduced;

- If impact pile driving is proposed, temporary noise control blanket barriers shall shroud pile drivers or be erected in a manner to shield the adjacent land uses. Such noise control blanket barriers can be rented and quickly erected;

- If impact pile driving is proposed, foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile. Pre-drilling foundation pile holes is a standard construction noise control technique. Pre-drilling reduces the number of blows required to seat the pile. Notify all adjacent land uses of the construction schedule in writing;

- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem are implemented.

- Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction.

With the implementation of these measures to control noise during construction activities, in accordance with Policy 7.11 and the Municipal Code allowable construction hours, the temporary construction noise impact would be reduced to a less-than-significant level.

Mitigation Measure 1a: No further mitigation required.

Impact 1b: Permanent Noise Level Increase/Exceed Applicable Standards. The proposed project would result in a substantial permanent traffic noise level increase at receptors in the project vicinity. Operational noise levels generated by the proposed project would potentially exceed Municipal Code thresholds. This is a **potentially significant** impact.

For a substantial permanent cumulative noise increase to occur, two qualifications must be met: 1) if the 2040 Scenario #2 (worst-case scenario) traffic volumes result in a noise level increase at sensitive receptors of 3 dBA CNEL and exceeds the "normally acceptable" level of 65 dBA CNEL or is 5 dBA CNEL or greater and remains "normally acceptable;" (at or under 65 dBA CNEL) and 2) if the 2040 cumulative plus project traffic volumes result in a 1 dBA CNEL or more noise level increase compared to 2040 cumulative (no project) conditions, which would be considered a cumulatively considerable contribution to the overall traffic noise increase. The City's General Plan defines 65 dBA CNEL exterior noise standard in Table 10-1 to be considered as "normally acceptable."

Tables 4 and 5 summarize the Municipal Code's thresholds for exterior and interior noise levels, respectively, as measured on the receiving land uses. For receiving land uses that include single- or multi-family residences, schools, hospitals, churches, or public libraries, exterior noise level thresholds are as follows:

- For noise sources that operate for 30 minutes or more in any given hour, 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA during nighttime hours (10:00 p.m. to 7:00 a.m.).

- For noise sources that operate for 15 minutes in any given hour, 60 dBA during daytime hours and 55 dBA during nighttime hours.

- For noise sources that operate for 5 minutes in any given hour, 65 dBA during daytime hours and 60 dBA during nighttime hours.

- For noise sources that operate for 1 minute in any given hour, 70 dBA during daytime hours and 65 dBA during nighttime hours.

- For noise sources that operate for 0 minutes in any given hour, 75 dBA during daytime hours and 70 dBA during nighttime hours.

Additionally, interior noise levels within dwelling units are as follows:

- For noise sources that operate for 5 minutes in any given hour, 45 dBA during daytime hours and 40 dBA during nighttime hours.

- For noise sources that operate for 1 minute in any given hour, 50 dBA during daytime hours and 45 dBA during nighttime hours.

- For noise sources that operate for 0 minutes in any given hour, 55 dBA during daytime hours and 50 dBA during nighttime hours.

Project Traffic Increase

SoundPLAN Version v8.2 was used to calculate the traffic noise increase expected for Scenario #2 (worst-case scenario) using data supplied by the traffic consultant. All of the predicted noise levels are summarized in Table 7. Noise level increases of 3 dBA CNEL or more for noise levels greater than 65 dBA CNEL or noise level increases of 5 dBA CNEL or more for noise levels equal to or less than 65 dBA CNEL are bolded in Table 7. Additionally for these bolded noise levels, if the permanent noise level increase is calculated to be greater than 1 dBA CNEL when compared to the 2040 cumulative no project scenario, these levels are highlighted in **green**. For these bolded levels highlighted in green, the corresponding road segments would be predicted to have a cumulatively significant increase in permanent noise levels due to increased traffic.

The road segments resulting in a significant cumulative noise increase due to increased traffic from Table 7 were:

a) Bay Road – University Avenue to Clarke Ave
b) Bay Road – Clarke Ave to Pulgas Ave

Both road segments have noise sensitive residential receptors in the vicinity. This is a significant impact.

Operational Noise

Various mechanical equipment for heating, ventilation, and cooling purposes, exhaust fans, emergency generators, and other similar equipment could produce noise levels exceeding the maximum noise limits when located near existing or proposed residential land uses. Additionally, potential noise-generating sources, such as truck deliveries or other project-specific noise sources, may also be proposed at the project-level. The number of variables inherent in the mechanical equipment needs of an individual project (number and types of units, locations, size, housing, specs, etc.), as well as details pertaining to project-specific noise sources, are unavailable at this time. The impacts of operational noise sources on nearby noise-sensitive uses should be assessed during the final design stage of individual projects. Conservatively, this is considered a potentially significant impact.

Summary of Project-Generated Noise

The City of East Palo Alto General Plan and Municipal Code provides policies and thresholds to reduce operational and transportation noise at sensitive receptors. Chapter 8.52 of the Municipal Code regulates all operational noise, single-event noises, and hours of operation to control noise-producing operations. Conservatively, this is considered a potentially significant impact.

Policy 7.2 establishes thresholds for permanent noise level increases that would help maintain or reduce transportation noise along major roadways. In accordance with the City's General Plan policies, project-specific mitigation may be required along roadway segments in the Plan Area that would result in a 3 dBA CNEL increase over the "normally acceptable" 65 dBA CNEL level and may result in a cumulatively considerable contribution to the overall noise environment. This is a significant impact.

Mitigation Measure 1b:

Operational Noise Mitigation

New developments within the Plan Area would be required to comply with City noise standards set forth in the General Plan and Municipal Code. To ensure compliance with the operational noise level thresholds required in the Municipal Code (Chapter 8.52), a qualified acoustical consultant will be retained to review mechanical equipment systems during final design of the proposed project consistent with standards City practice. The consultant shall review selected equipment and determine specific noise reduction measures necessary to reduce noise to comply with the City's noise level requirements.

Noise reduction measures could include, but are not limited to, selection of equipment that emits low noise levels and/or installation of noise barriers, such as enclosures and parapet walls, to block the line-of-sight between the noise source and the nearest receptors. Additionally, enclosures and interior wall treatments shall be considered to reduce noise exposure within the on-site units. Alternate measures may include locating equipment in less noise-sensitive areas, where feasible. The measures recommended by the acoustical consultant to ensure compliance with the City's requirements would be implemented as project conditions of approval, and therefore, this would be a less-than-significant impact.

Cumulative Traffic Noise Mitigation

A quieter Open-Graded Asphalt Concrete or a Rubberized Asphaltic Concrete pavement installed at the identified road segments where a significant cumulative noise increase is identified would reduce noise levels by 5 dBA or more from existing conditions provided these pavements are repaved every 10 years to maintain the noise level reduction. This implementation would reduce cumulative traffic noise impacts to a less-than-significant level.

Sound insulation treatments to buildings (such as sound rated windows and doors) could reduce noise levels in interior spaces. New noise barriers could reduce noise levels by 5 dBA CNEL. Final design of such barriers, including an assessment of their feasibility and reasonableness, should be completed during project level review.

Significance After Mitigation:

Mitigation measures recommended for operational noise increases would reduce the potential impacts to a less-than-significant level. For cumulative traffic noise increases, the mitigation measures recommended involving re-paving the identified road segments would reduce cumulative impacts to a less-than-significant level.

Impact 2: **Exposure to Excessive Groundborne Vibration due to Construction.** Construction-related vibration levels resulting from activities at the project site would potentially exceed the City's thresholds at surrounding buildings. This is a **potentially significant** impact.

The construction of the project may generate vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction activities would include grading, foundation work, paving, and new building framing and finishing. Detailed information regarding construction equipment and phasing are not available at this time. Therefore, impact or vibratory pile driving activities, which can cause excessive vibration, may be required for the projects within the Plan Area.

Policy 6.4 of the City's General Plan limits vibration levels to 0.08 in/sec PPV at sensitive historic structures and to 0.30 in/sec PPV at buildings of normal conventional construction to minimize the potential for cosmetic damage.

Table 12 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet, as well as distances to the 0.08 in/sec PPV threshold for historical buildings and to the 0.25 in/sec PPV threshold for nonhistorical buildings. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.), may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

Pile driving has the potential of generating the highest ground vibration levels and is of primary concern to architectural damage, particularly when it occurs within 100 to 200 feet of structures. Vibration levels generated by pile driving activities would vary depending on project conditions, such as soil conditions, construction methods, and equipment used, but could exceed the recommended PPV thresholds to avoid architectural damage. Other project construction activities, such as caisson drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.), may also potentially generate substantial vibration in the immediate vicinity.

Depending on the proximity of existing structures to each construction site, the structural soundness of the existing buildings, and the methods of construction used, vibration levels may be high enough to damage existing structures. Given the scope of the proposed project and the location of Area Plan with respect to existing structures in the immediate vicinity (i.e., within 200 feet), groundborne vibration impacts would be potentially significant.

As with any type of construction, vibration levels may at times be perceptible. However, construction phases that have the highest potential of producing vibration (pile driving and use of jackhammers and other high-power tools) would be intermittent and would only occur for short periods of time for any individual project site. By use of administrative controls, such as notifying neighbors of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration to hours with least potential to affect nearby businesses, perceptible vibration can be kept to a minimum and as such would not result in a significant impact with respect to perception.

TABLE 12 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Minimum Distance to Meet 0.08 in/sec PPV (feet)	Minimum Distance to Meet 0.3 in/sec PPV (feet)
Pile Driver (Impact)	upper range	1.158	271	86
	typical	0.644	160	51
Pile Driver (Sonic)	upper range	0.734	180	57
	typical	0.170	48	15
Clam shovel drop		0.202	56	18
Hydromill (slurry wall)	in soil	0.008	3	1
	in rock	0.017	6	2
Vibratory Roller		0.210	58	19
Hoe Ram		0.089	27	9
Large bulldozer		0.089	27	9
Caisson drilling		0.089	27	9
Loaded trucks		0.076	23	8
Jackhammer		0.035	12	4
Small bulldozer		0.003	2	<1

Source: Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, Office of Planning and Environment, U.S. Department of Transportation, September 2018, modified by Illingworth & Rodkin, Inc. January 2023.

Mitigation Measure 2:

To address potential impacts related to vibration, the project will implement the following vibration controls in addition to the measures included in Policy 7.11 of the City's General Plan:

- Comply with the construction noise ordinance to limit hours of exposure. The City's Municipal Code allows construction activities between the hours 7:00 a.m. and 6:00 p.m. on weekdays and between 9:00 a.m. and 5:00 p.m. on Saturdays. Construction activity is not permitted on Sundays or national holidays.

- Prohibit the use of heavy vibration-generating construction equipment within 25 feet of residences. Use a smaller vibratory roller, such as the Caterpillar model CP433E vibratory compactor, when compacting materials within 25 feet of residences adjoining the site.

- Avoid dropping heavy equipment within 25 feet of residences. Use alternative methods for breaking up existing pavement, such as a pavement grinder, instead of dropping heavy objects within 25 feet of residences adjoining the site.

- The contractor shall alert heavy equipment operators to the close proximity of the adjacent structures so they can exercise extra care.

- For projects requiring impact or vibratory pile driving, a Construction Vibration Monitoring, Treatment, and Reporting Plan shall be implemented to document conditions prior to, during,

and after vibration-generating construction activities. All plan tasks shall be undertaken under the direction of a licensed Professional Structural Engineer in the State of California and be in accordance with industry-accepted standard methods. The construction vibration monitoring plan shall include, but not be limited to, the following measures:

- Document conditions at all structures located within 90 feet of pile driving activities and at historic structures located within 275 feet of pile driving activities prior to, during, and after vibration-generating construction activities. All plan tasks shall be undertaken under the direction of a licensed Professional Structural Engineer in the State of California and be in accordance with industry-accepted standard methods. Specifically:

    - Vibration limits shall be applied to vibration-sensitive structures located within 90 feet of any high impact construction activities, such as pile driving, and 275 feet of historic buildings.

    - Performance of a photo survey, elevation survey, and crack monitoring survey for each structure of normal construction within 90 feet of any high impact construction activities and each historic structure within 275 feet of pile driving activities. Surveys shall be performed prior to any construction activity, in regular intervals during construction, and after project completion, and shall include internal and external crack monitoring in structures, settlement, and distress, and shall document the condition of foundations, walls and other structural elements in the interior and exterior of said structures.

- Develop a vibration monitoring and construction contingency plan to identify structures where monitoring would be conducted, set up a vibration monitoring schedule, define structure-specific vibration limits, and address the need to conduct photo, elevation, and crack surveys to document before and after construction conditions. Construction contingencies shall be identified for when vibration levels approached the limits.

- At a minimum, vibration monitoring shall be conducted during all pile driving activities.

- If vibration levels approach limits, suspend construction and implement contingency measures to either lower vibration levels or secure the affected structures.

- Designate a person responsible for registering and investigating claims of excessive vibration. The contact information of such person shall be clearly posted on the construction site.

- Conduct a post-construction survey on structures where either monitoring has indicated high vibration levels or complaints of damage has been made. Make appropriate repairs or compensation where damage has occurred as a result of construction activities.

The construction noise logistics plan, including the above-listed measures will be implemented as a project condition of approval, consistent with the City's standard practice. The implementation of the construction noise logistics plan with these construction vibration controls would reduce the impact to a less-than-significant level.

Impact 3: **Excessive Aircraft Noise.** The project would not expose people working in the project area to excessive aircraft noise levels. **This is a less-than-significant impact.**

The Palo Alto Airport is a general aviation airport located approximately 0.6 mile southeast of the Plan Area. The Plan Area lies outside the 65 dBA CNEL noise contour, as shown in Figure 5. For residential uses, the exterior noise threshold of 65 dBA CNEL would not be exceeded. Additionally, the exterior noise thresholds for all other uses is not expected to be exceeded due to aircraft activity.

Standard residential construction materials provide exterior-to-interior noise level reduction of 15 dBA with windows partially open and 20 dBA with windows shut. Standard office, commercial, and industrial construction materials would achieve a 25 to 30 dBA exterior-to-interior noise reduction with the windows closed.

Interior noise levels at office, commercial, and industrial buildings during daytime operational hours would be below the City's 45 dBA $L_{eq(12)}$ threshold, and residential interiors would meet the threshold with windows shut.
Other airports in the vicinity of the project site include the Moffett Federal Airfield (4.8 miles southeast), Norman Y. Mineta San José International Airport (12 miles southeast), San Carlos Airport (6 miles northwest), and San Francisco International Airport (15 miles northwest). The project site lies outside the areas of influence for each of the airports, and the noise environment at the site would not substantially increase due to aircraft noise from these airports.

Mitigation Measure 3: No mitigation required.

Appendix A

FIGURE A1 Daily Trend in Noise Levels at LT-1, Wednesday, October 12, 2022

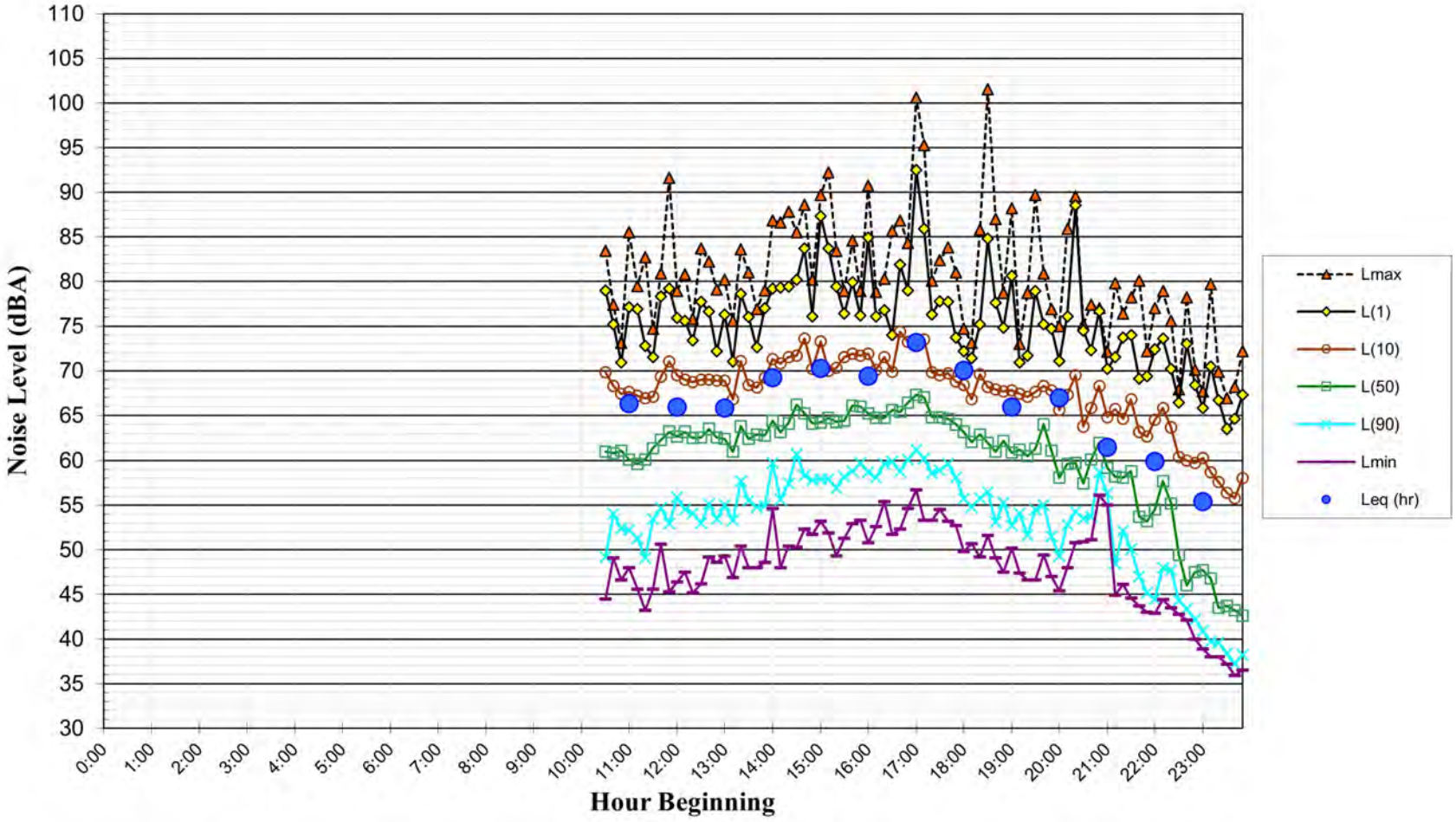


FIGURE A2 Daily Trend in Noise Levels at LT-1, Thursday, October 13, 2022

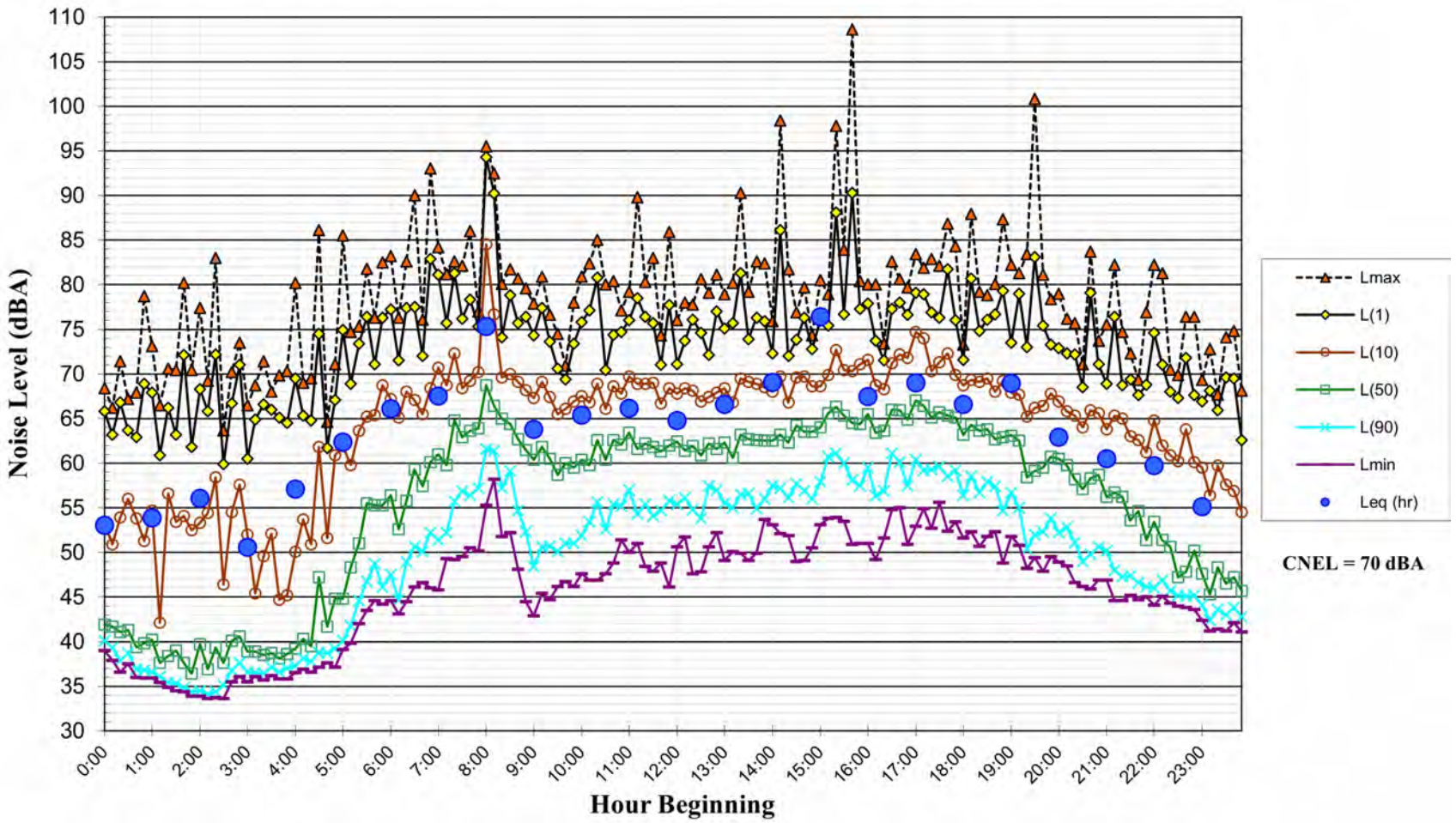


FIGURE A3 Daily Trend in Noise Levels at LT-1, Friday, October 14, 2022

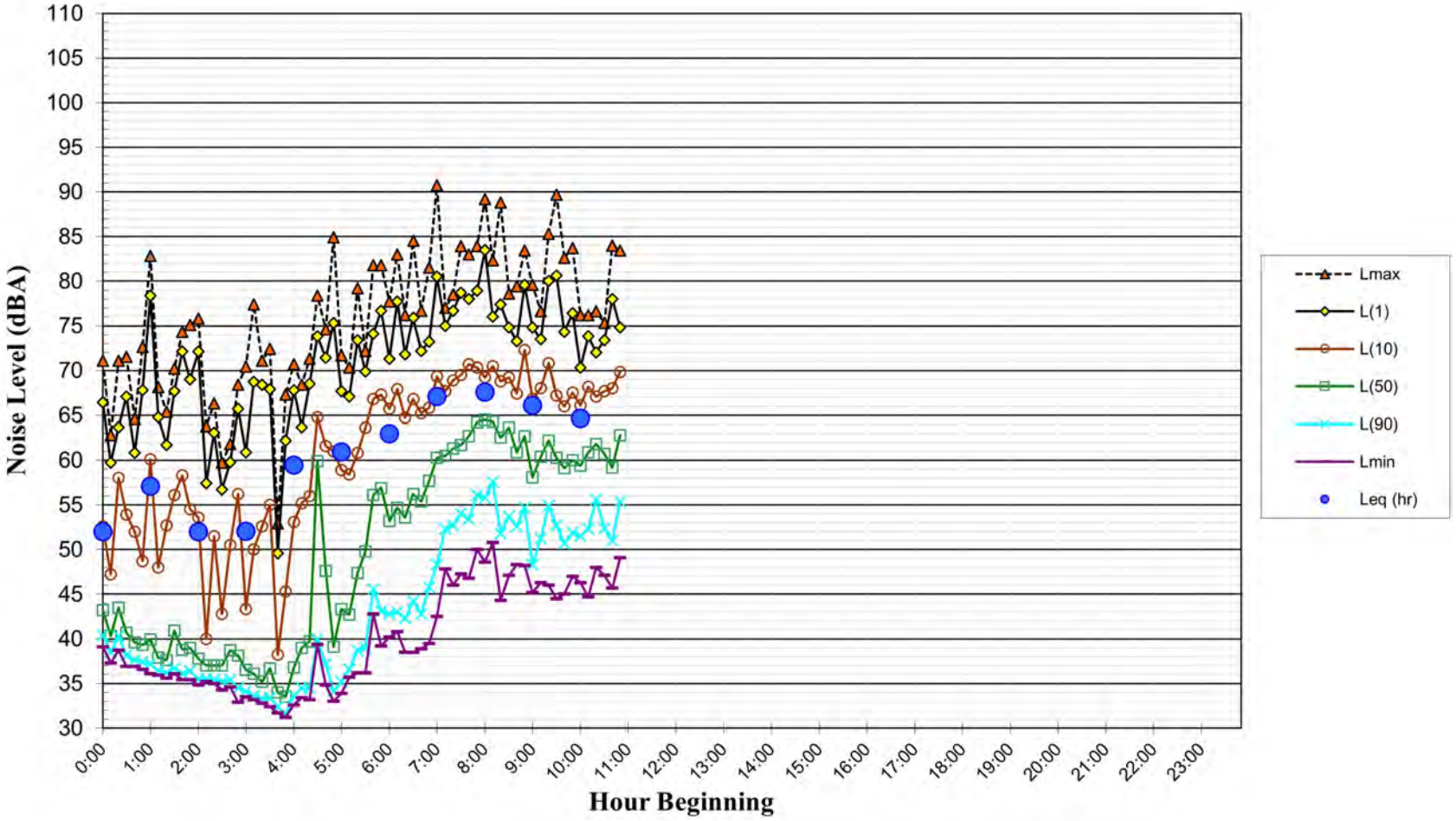


FIGURE A4 Daily Trend in Noise Levels at LT-2, Wednesday, October 12, 2022

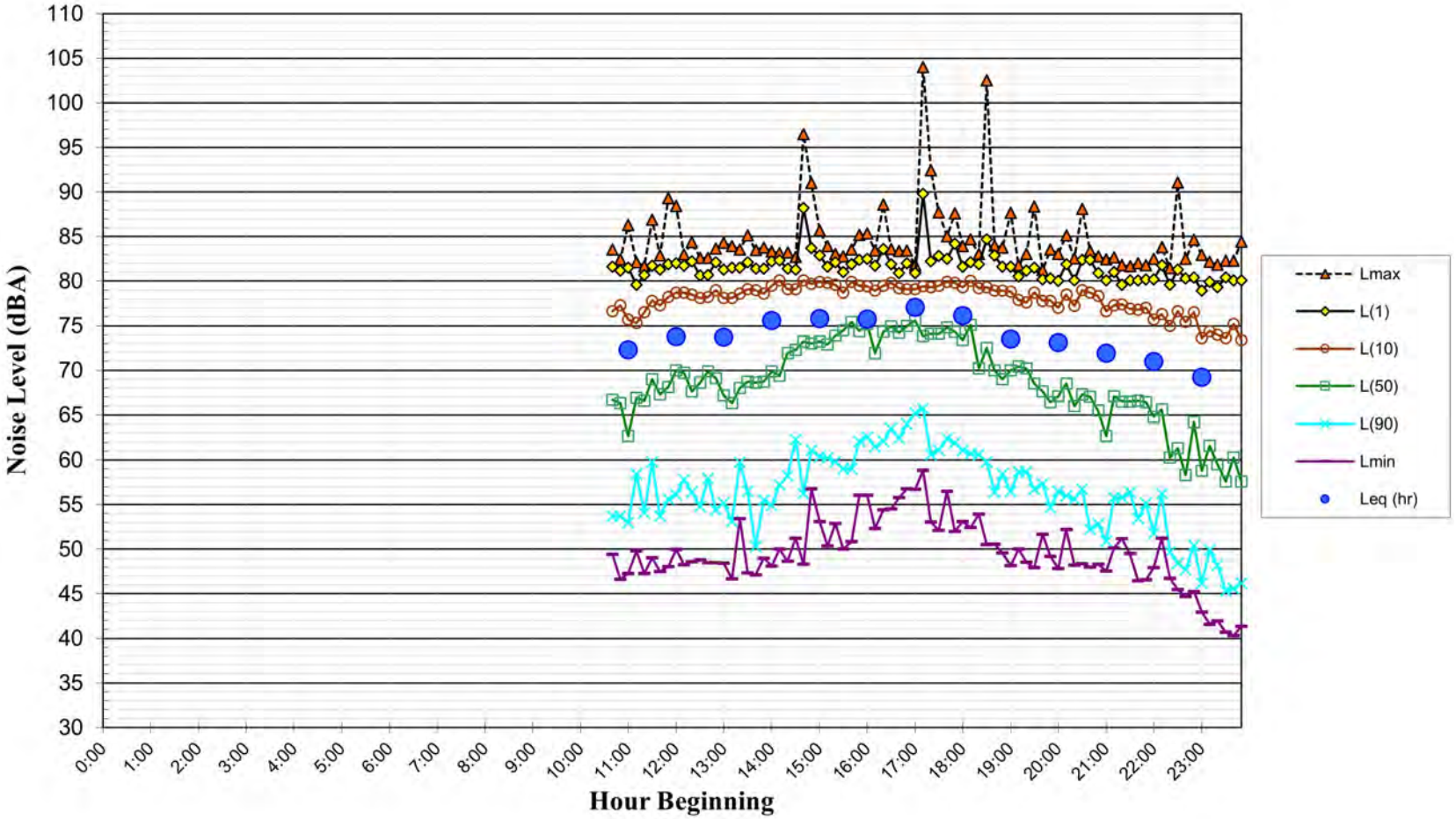


FIGURE A5 Daily Trend in Noise Levels at LT-2, Thursday, October 13, 2022

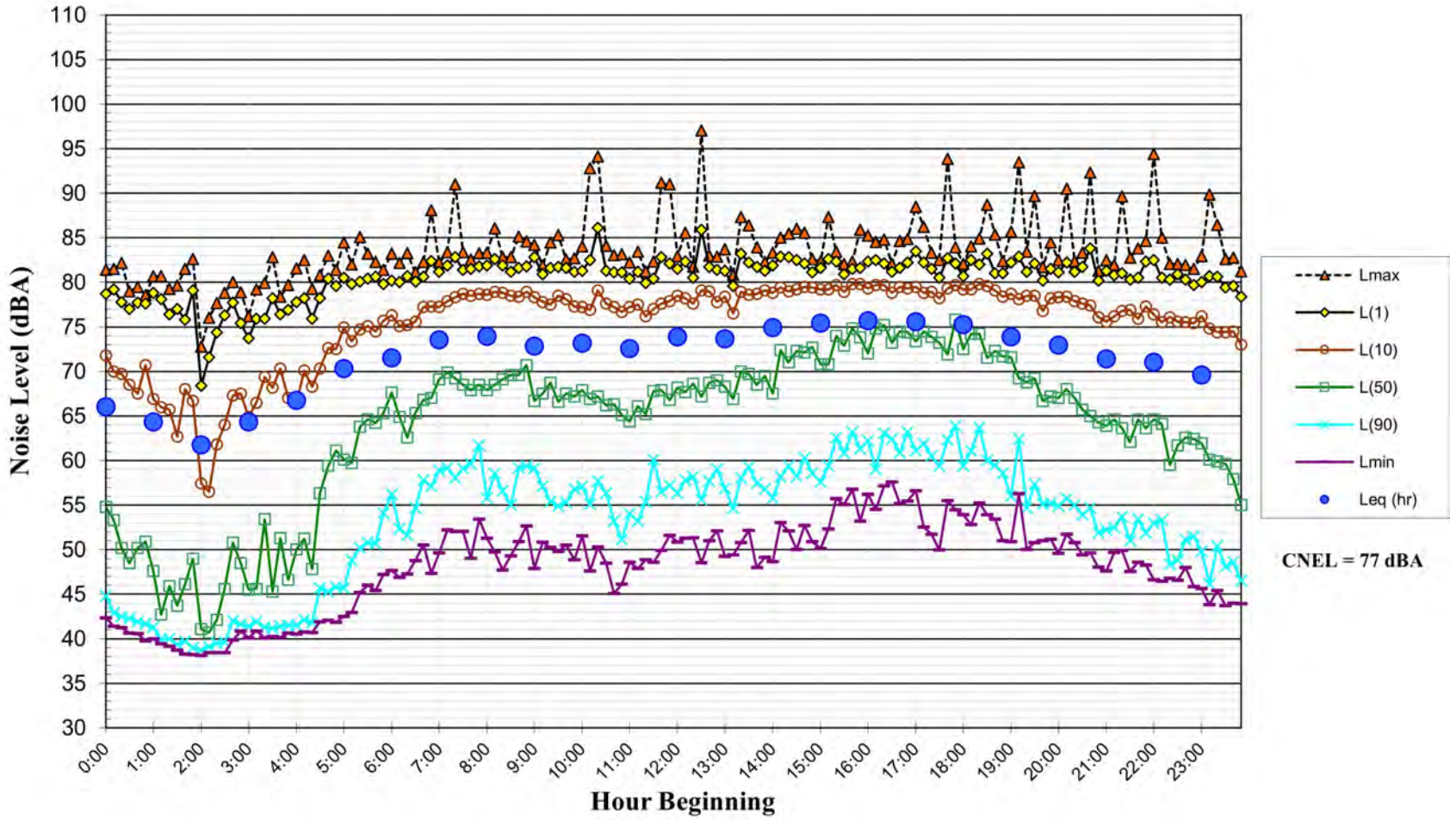


FIGURE A6 Daily Trend in Noise Levels at LT-2, Friday, October 14, 2022

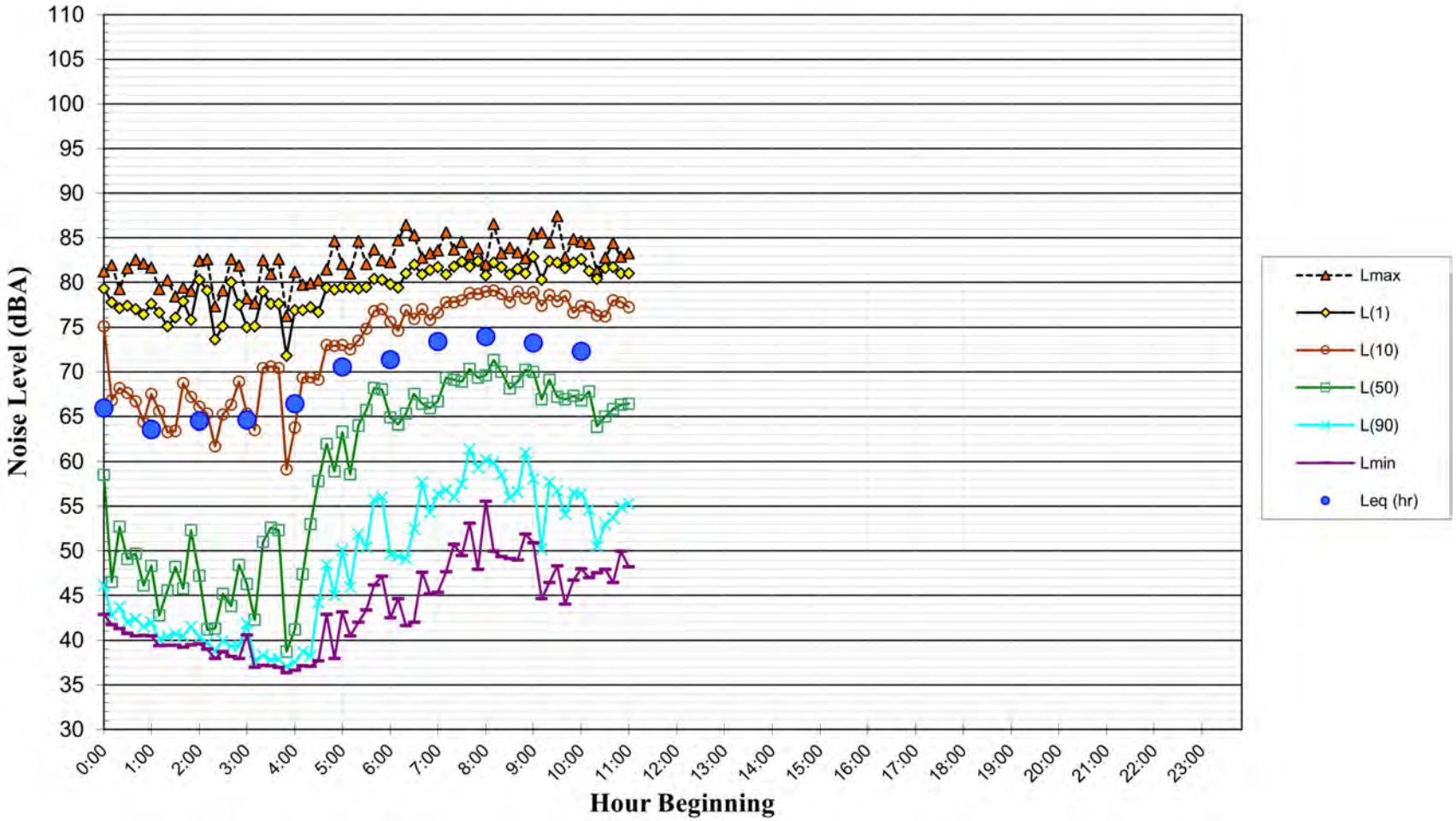


FIGURE A7 Daily Trend in Noise Levels at LT-3, Wednesday, October 12, 2022

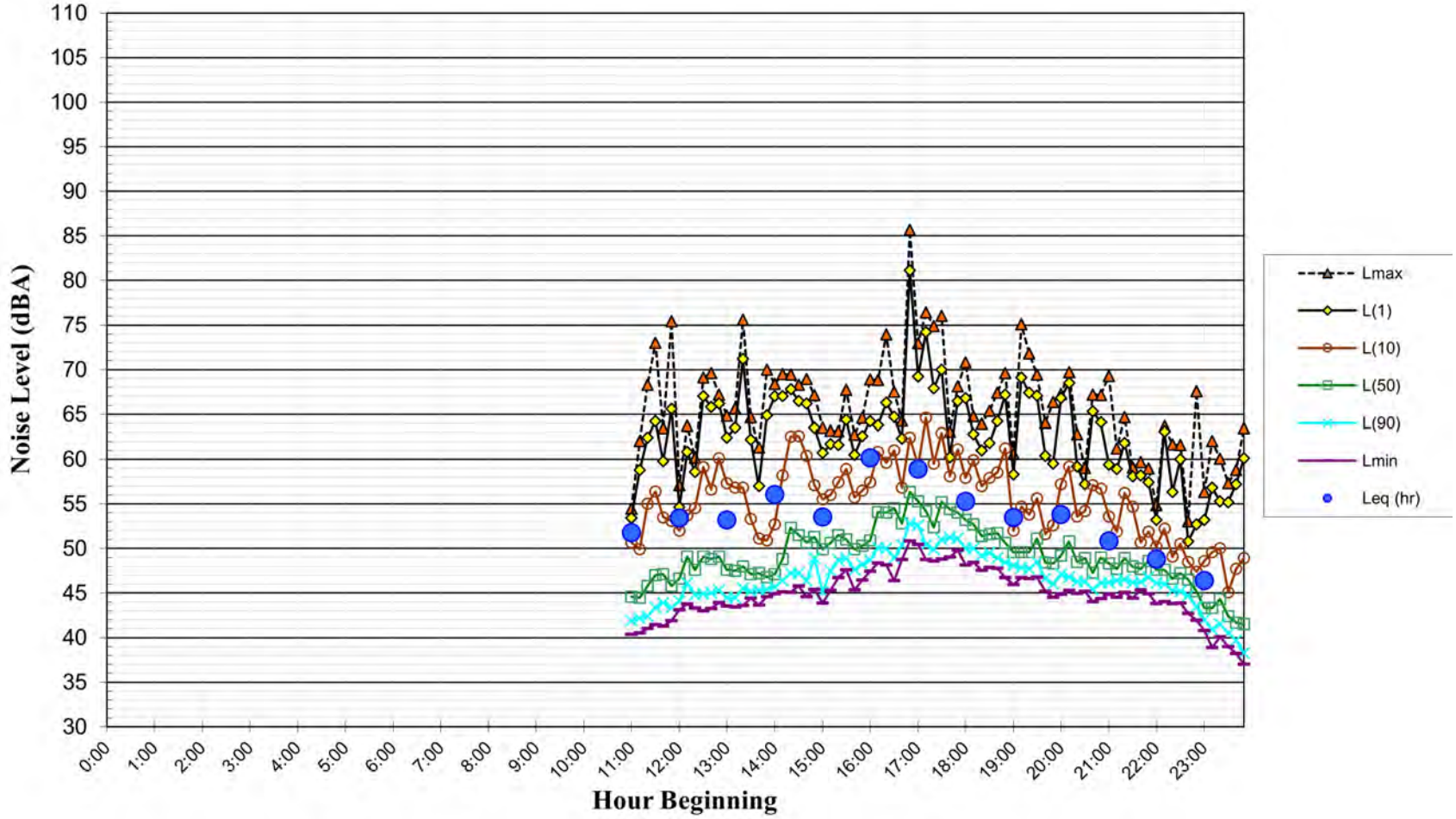


FIGURE A8 Daily Trend in Noise Levels at LT-3, Thursday, October 13, 2022

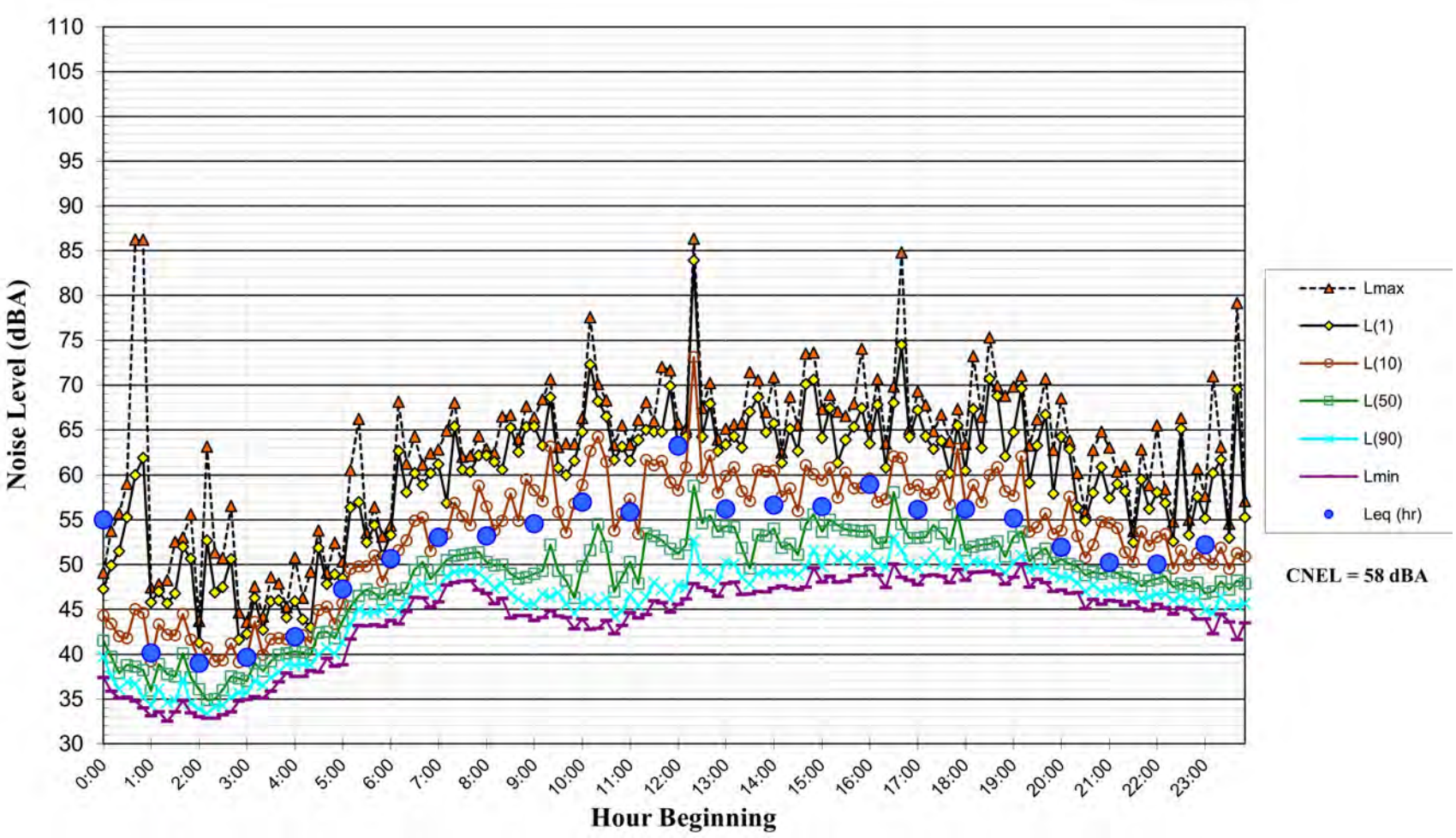


FIGURE A9 Daily Trend in Noise Levels at LT-3, Friday, October 14, 2022

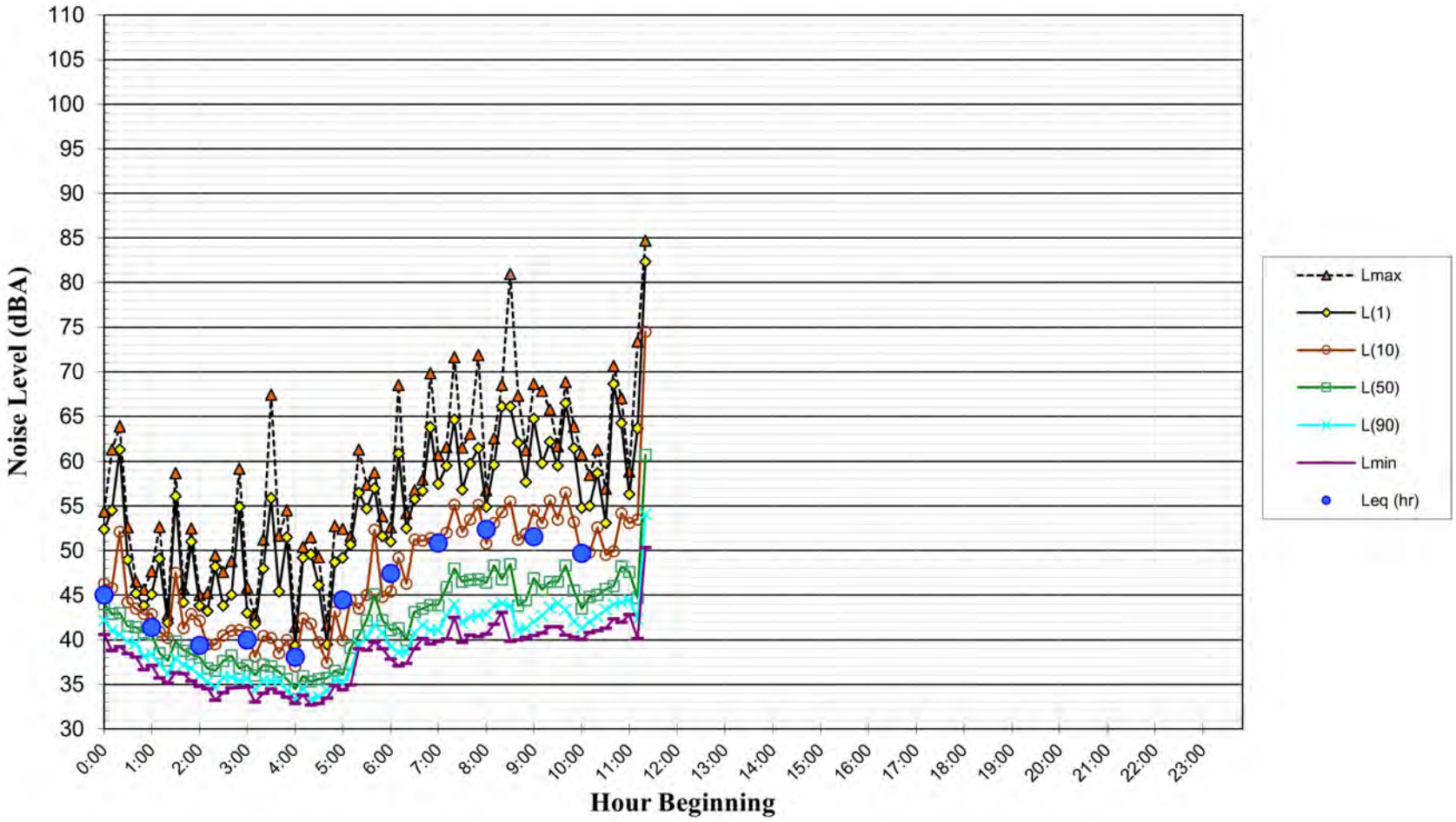


FIGURE A10 Daily Trend in Noise Levels at LT-4, Wednesday, October 12, 2022

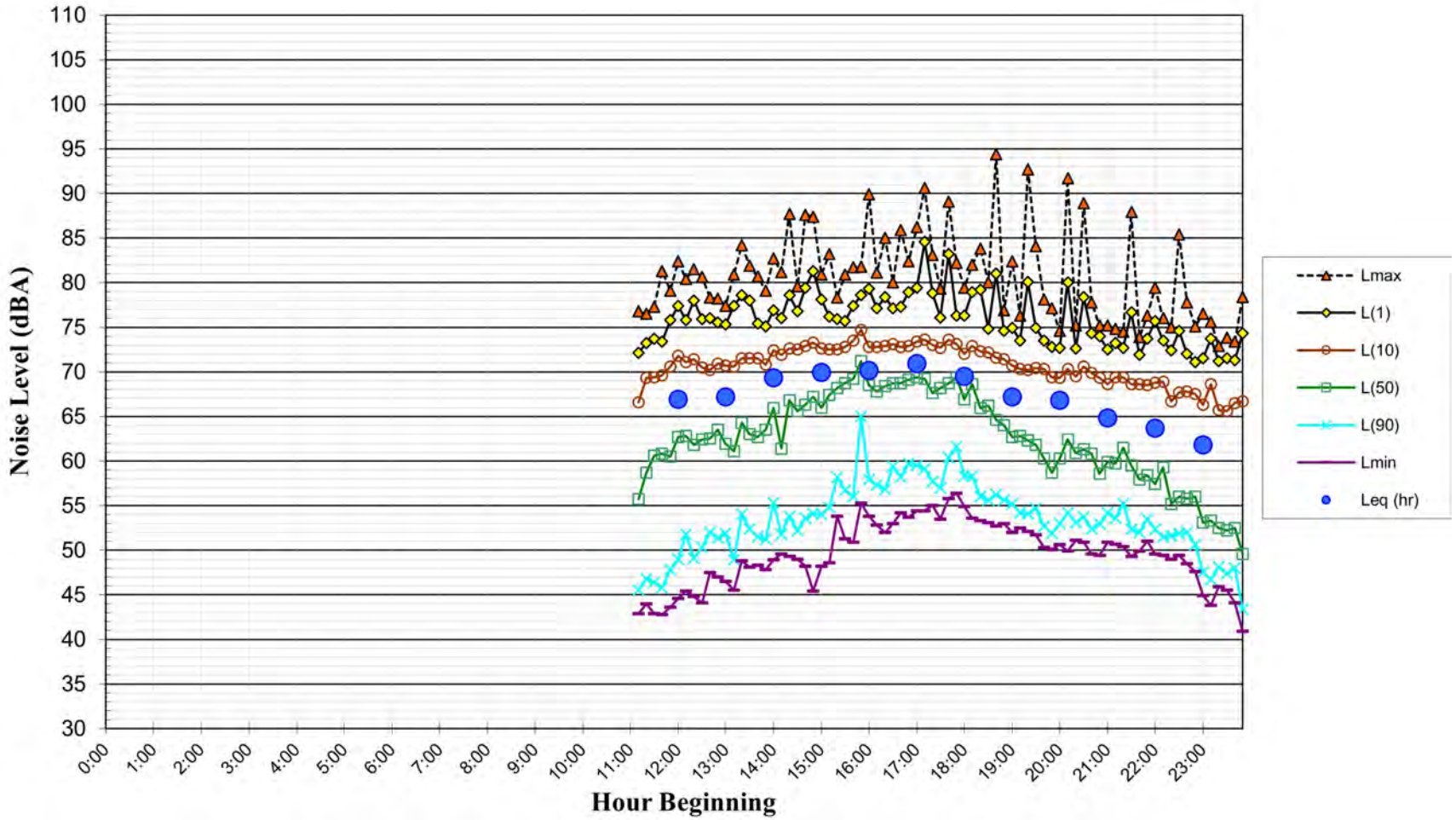


FIGURE A11 Daily Trend in Noise Levels at LT-4, Thursday, October 13, 2022

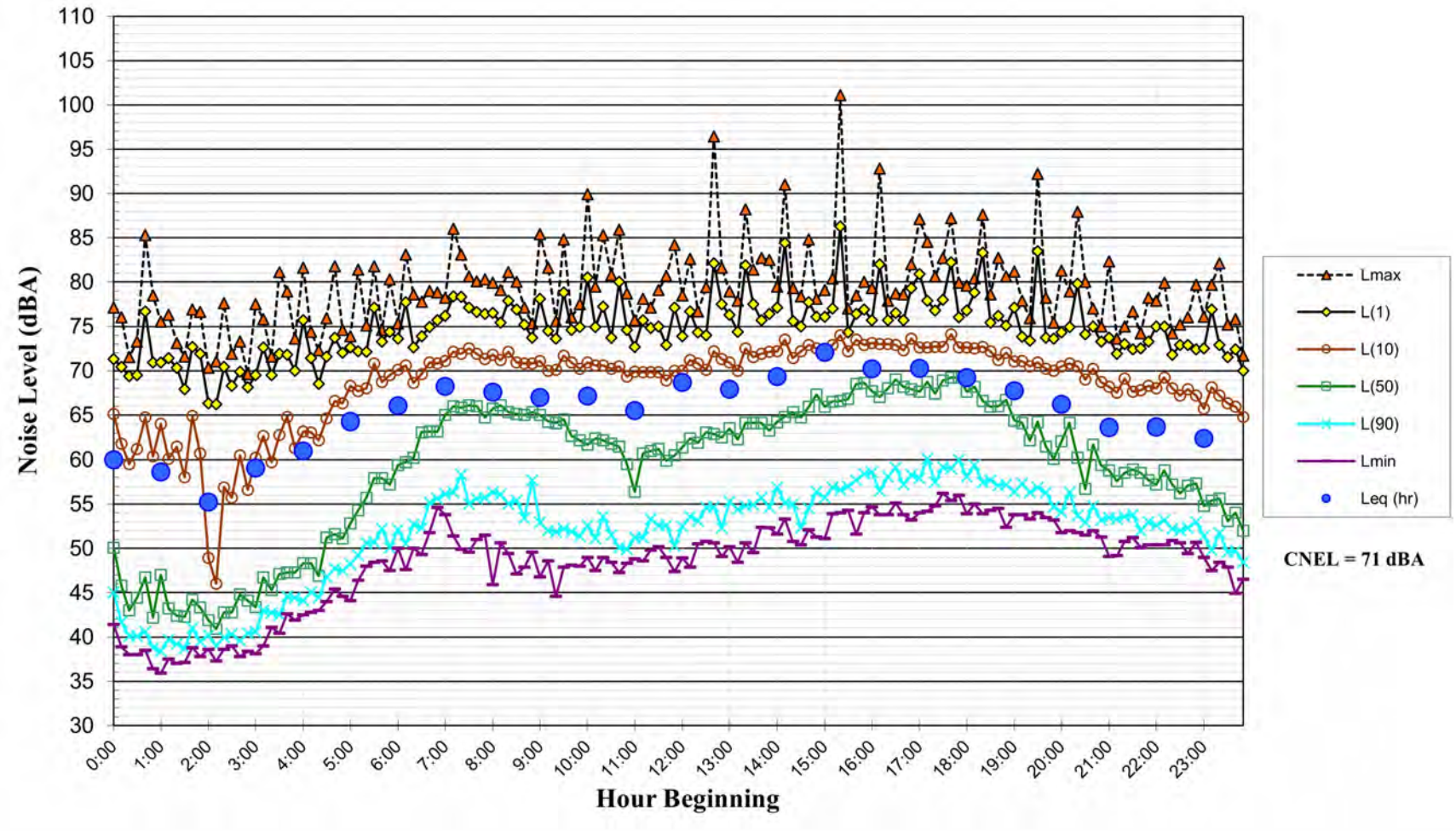


FIGURE A12 Daily Trend in Noise Levels at LT-4, Friday, October 14, 2022