RESOLUTION NO. 23-9256

A RESOLUTION OF THE CITY OF SANTA CLARA, CALIFORNIA, TO ADOPT THE MITIGATED NEGATIVE DECLARATION AND THE MITIGATION MONITORING AND REPORTING PROGRAM FOR THE 2655 THE ALAMEDA MIXED USE PROJECT LOCATED AT 2655 THE ALAMEDA, SANTA CLARA

PLN22-00448 (General Plan Amendment and Rezone)
SCH# 2023040354

WHEREAS, on August 10 2022, Anjuli Habbas representing Kapital Alameda, LLC ("Owner") filed an application for the vacant and unimproved 0.4-acre site located at 2655 The Alameda ("Project Site");

WHEREAS, the Owner applied for a General Plan Amendment from Neighborhood Commercial to Very High Density Residential and to Rezone the Project Site from Neighborhood Commercial (CN) to Planned Development (PD) to allow a four-story, mixed use development with 1,500 square feet of retail/commercial uses and 39 multifamily units, 46 subgrade and first floor parking spaces (38 auto and 8 motorcycle spaces), landscaping, and public and private on- and off-site improvements ("Project") as shown on the Development Plans, attached hereto and incorporated herein by this reference;

WHEREAS, the Project approvals will include Resolution No. 23-9257 ("City Council General Plan Amendment "); Resolution No. 23-9258 ("City Council Rezoning Resolution"); and this California Environmental Quality Act ("CEQA") Resolution (collectively, the "Approvals");

WHEREAS, pursuant to the California Environmental Quality Act (CEQA), and the regulations implementing the Act, specifically 14 Cal. Code of Regs § 15070, this Project was determined after an Initial Study to identify potentially significant effects on the environment which could be avoided with the implementation of mitigation measures, resulting in the drafting of a Mitigated Negative Declaration ("MND") and Mitigation Monitoring and Reporting Program ("MMRP");

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WHEREAS, in conformance with CEQA, the MND was noticed and circulated for a 30-day public review period to the State Office of Planning and Research, Santa Clara County Clerk's Office, and interested parties property owners within 1,000 feet of the Project Site boundaries from April 13, 2023 to May 15, 2023; where during that period comment letters were received from San Jose Mineta International Airport, the California Department of Transportation and Valley Water, and along with the attached Responses to Comments Received on the MND are made part of the record;

WHEREAS, on June 21, 2023, a newspaper notice for this item was published in *The Weekly*, a newspaper of general circulation, for the Planning Commission meeting on July 13, 2023 and City Council meeting of August 29, 2023;

WHEREAS, on June 29, 2023, notices of the public meeting for the Planning Commission meeting of July 13, 2023 were posted in at least three conspicuous locations within 300 feet of the Project Site, and mailed to property owners within 1,000 feet of the Project Site boundaries;

WHEREAS, on July 13, 2023, the Planning Commission considered the Project, MND, MMRP and all pertinent information in the record including public testimony, at the conclusion of which the Planning Commission voted to recommend that the City Council adopt the MND and MMRP, approve the General Plan Amendment and rezone to allow a four-story, mixed use development with 1,500 square feet of retail/commercial uses and 39 multifamily units, 46 subgrade and first floor parking spaces, landscaping, and public and private on- and off-site improvements;

WHEREAS, on August 17, 2023, notices of the public meeting for the City Council meeting of August 29, 2023 were posted in at least three conspicuous locations within 300 feet of the Project Site, and mailed to property owners within 1,000 feet of the Project Site boundaries;

WHEREAS, the City Council reviewed the MND prepared for the Project, City staff report pertaining to the MND and all evidence at a duly noticed public hearing on August 29, 2023. All these documents and evidence are herein incorporated by reference into this Resolution.

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NOW THEREFORE, BE IT RESOLVED BY THE CITY OF SANTA CLARA AS FOLLOWS:

1. That the City Council hereby finds that the above Recitals are true and correct and by this reference makes them a part hereof.

2. That the City Council finds that all potentially significant environmental impacts that may directly or indirectly result from the Project would be reduced to a less-than-significant level by the mitigation measures specified in the MND and MMRP.

3. That the City Council hereby finds that the MND is complete, prepared in compliance with CEQA, and represents the independent judgment of the City Council.

4. That the City Council finds that the MND and MMRP completed for this Project has been completed in compliance with CEQA, and that approval of this Project as mitigated will have no significant negative impacts on the area's environmental resources, cumulative or otherwise, as the impacts as mitigated would fall within the environmental thresholds identified by CEQA.

5. That the City Council hereby adopts the MND and MMRP for the Project.

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6. That the City Council hereby designates the Planning Division of the Community Development Department as the location for the documents and other material that constitute the record of proceedings upon which this decision is based and designates the Director of Community Development as the custodian of records.

7. Effective date. This resolution shall become effective immediately.

I HEREBY CERTIFY THE FOREGOING TO BE A TRUE COPY OF A RESOLUTION PASSED AND ADOPTED BY THE CITY OF SANTA CLARA, CALIFORNIA, AT A REGULAR MEETING THEREOF HELD ON THE 29TH DAY OF AUGUST, 2023, BY THE FOLLOWING VOTE:

AYES:	COUNCILORS:	Becker, Chahal, Hardy, Jain, and Watanabe, and Mayor Gillmor
NOES:	COUNCILORS:	Park
ABSENT:	COUNCILORS:	None
ABSTAINED:	COUNCILORS:	None

ATTEST: _____
NORA PIMENTEL, MMC
ASSISTANT CITY CLERK
CITY OF SANTA CLARA

Attachments Incorporated by Reference:
1. Mitigated Negative Declaration (MND)
2. Mitigation Monitoring and Reporting Program (MMRP)
3. Responses to Comments Received on the MND
4. Development Plans

Draft Initial Study

2655 The Alameda Mixed Use Project

Prepared by

CITY OF SANTA CLARA CALIFORNIA
1852
THE MISSION CITY

In Consultation with

50 YEARS EST. 1972
DAVID J. POWERS & ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS & PLANNERS

April 2023

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SECTION 1.0 INTRODUCTION AND PURPOSE

1.1 PURPOSE OF THE INITIAL STUDY

The City of Santa Clara, as the Lead Agency, has prepared this Initial Study for the 2655 The Alameda Mixed Use Project in compliance with the California Environmental Quality Act (CEQA), the CEQA Guidelines (California Code of Regulations §15000 et. seq.) and the regulations and policies of the City of Santa Clara, California.

The project proposes to construct a four-story mixed-use development featuring ground floor retail and 39 residential units. This Initial Study evaluates the environmental impacts that might reasonably be anticipated to result from implementation of the proposed project.

1.2 PUBLIC REVIEW PERIOD

Publication of this Initial Study marks the beginning of a 30-day public review and comment period. During this period, the Initial Study will be available to local, state, and federal agencies and to interested organizations and individuals for review. Written comments concerning the environmental review contained in this Initial Study during the 30-day public review period should be sent to:

City of Santa Clara
Debby Fernandez, Associate Planner
dfernandez@cityofsantaclara.com

1.3 CONSIDERATION OF THE INITIAL STUDY AND PROJECT

Following the conclusion of the public review period, the City of Santa Clara will consider the adoption of the Initial Study/Mitigated Negative Declaration (MND) for the project at a regularly scheduled meeting. The City shall consider the Initial Study/MND together with any comments received during the public review process. Upon adoption of the MND, the City may proceed with project approval actions.

1.4 NOTICE OF DETERMINATION

If the project is approved, the City of Santa Clara will file a Notice of Determination (NOD), which will be available for public inspection and posted within 24 hours of receipt at the County Clerk's Office for 30 days. The filing of the NOD starts a 30-day statute of limitations on court challenges to the approval under CEQA (CEQA Guidelines Section 15075(g)).

SECTION 2.0 PROJECT INFORMATION

2.1 PROJECT TITLE

2655 The Alameda Mixed-Use Development

2.2 LEAD AGENCY CONTACT

Debby Fernandez, Associate Planner
DFernandez@santaclaraca.gov
1500 Warburton Ave
Santa Clara, CA 95050

2.3 PROJECT APPLICANT

Ken Rodrigues and Partners Inc.

2.4 PROJECT LOCATION

2655 The Alameda, Santa Clara, CA, See Figure 2.4-1, 2.4-2, and 2.4-3 for site location.

2.5 ASSESSOR'S PARCEL NUMBER

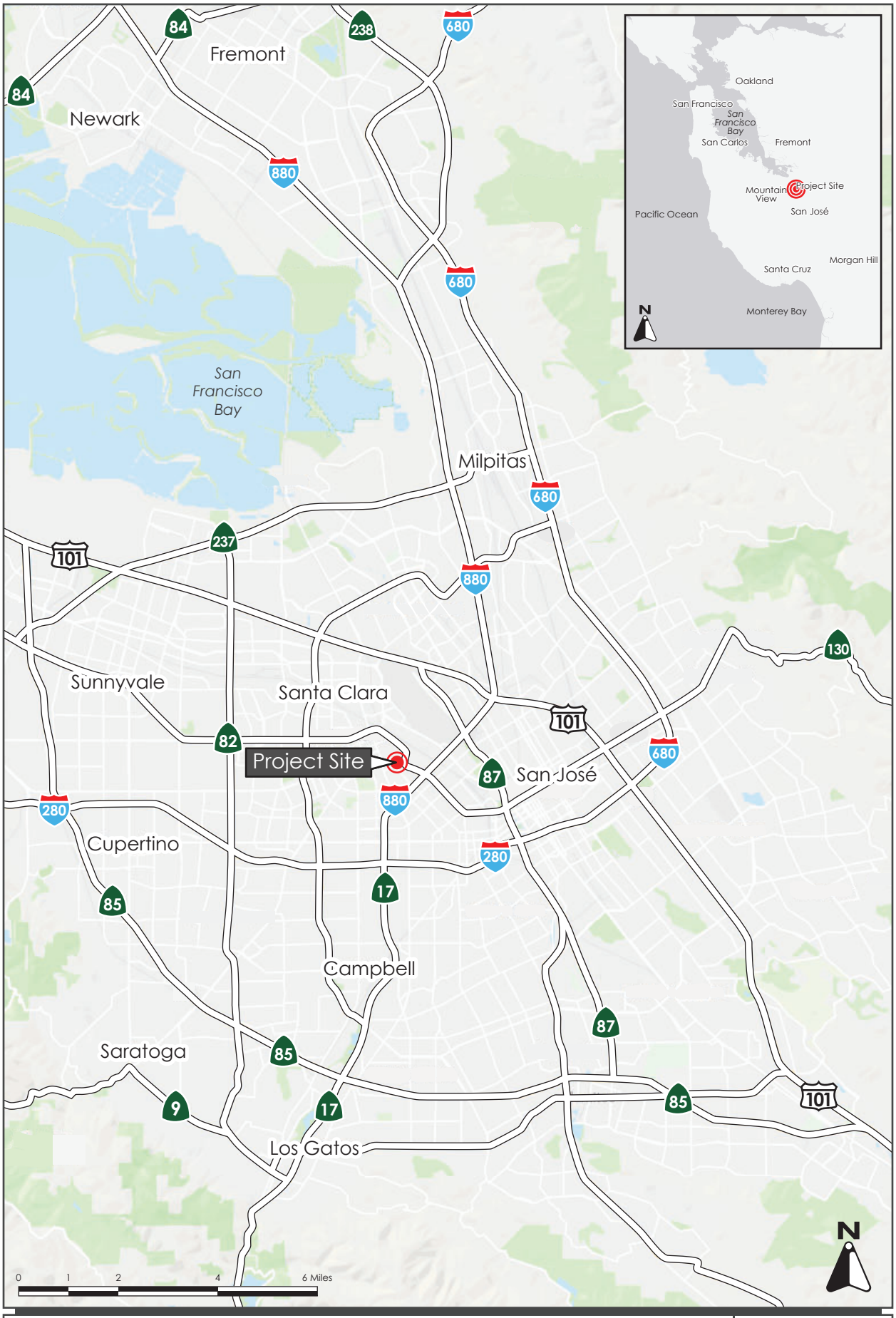
230-12-012

2.6 GENERAL PLAN DESIGNATION AND ZONING DISTRICT

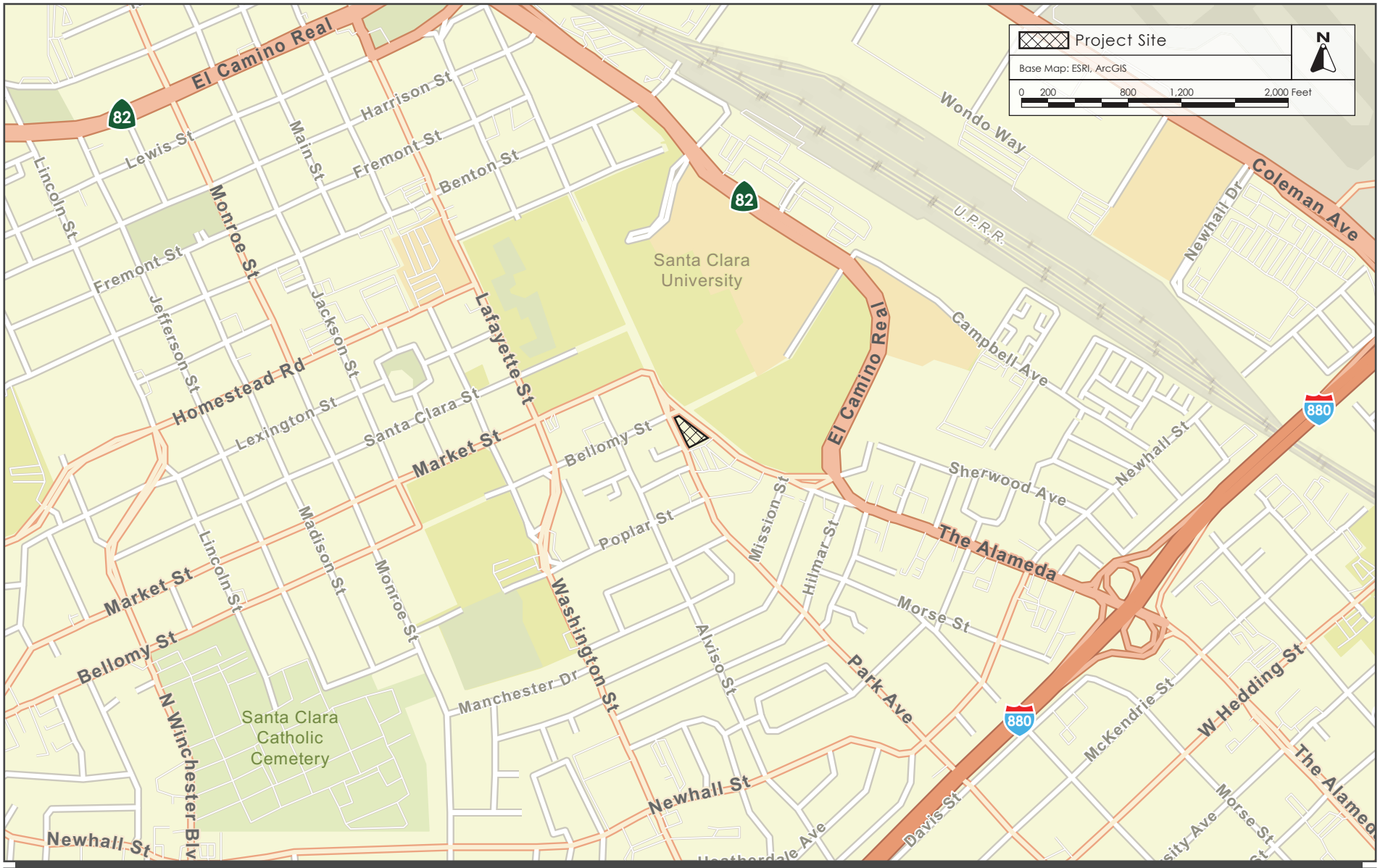
General Plan – Neighborhood Mixed Use
Zoning – Neighborhood Commercial

2.7 PROJECT-RELATED APPROVALS, AGREEMENTS, AND PERMITS

General Plan Amendment
Rezoning
Architectural Review



REGIONAL MAP | FIGURE 2.4-1



VICINITY MAP

FIGURE 2.4-2



AERIAL PHOTOGRAPH AND SURROUNDING LAND USES | FIGURE 2.4-3

SECTION 3.0 PROJECT DESCRIPTION

3.1 EXISTING SITE

The project site is a 0.4-acre vacant parcel (APN 230-12-012) located at the corner of Park Avenue and The Alameda (2655 The Alameda) in the City of Santa Clara. The triangular shaped parcel is bordered by a parking lot on the south side of the site which serves a grocery store beyond, The Alameda to the east, and Park Avenue to the west. The site is near commercial and single-family residences to the west, and housing for the Santa Clara University on the north and east.

The project site is zoned Neighborhood Commercial. This is a limited commercial zone that allows for retail businesses to serve the surrounding residential neighborhood. The permitted uses for this designation include, retail sales or rentals, sales of personal or financial services, and incidental accessory buildings.

3.2 PROPOSED DEVELOPMENT

The proposed project would construct a four-story mixed-use development with 39 residential units, at a density of 98 units per acre, and approximately 1,540 square feet of retail space. The project would include 33 parking spaces which would be provided in one subgrade parking level (23 spaces) and a surface parking lot (10 spaces) located within the development. The project includes common open space activity areas on the second, third and fourth floors in the form of a central courtyard-outdoor deck space. The amenity areas of the proposed project would include seating, planters, barbeque, and outdoor gathering spaces for use by future residents.

The project building would be approximately 63 feet tall. In addition to the development the project proposes a General Plan Amendment from Neighborhood Mixed Use to Very High-Density Residential which would allow for ground floor retail and a rezoning to Planned Development (PD).

3.2.1 Construction

Construction of the proposed project would take place over the course of 17 months with construction occurring from 7:00 am to 6:00 pm Monday through Friday. The excavation on-site would remove approximately 7,400 cubic yards of soil. Additionally, the proposed project would not require demolition or pile driving.

3.2.2 Landscaping

The proposed project would remove one tree from the project site and would plant 13 trees in sidewalk wells on the streets bordering the project. Additionally, the proposed project would include vegetated planters on the borders of the project site and a landscaped podium on the second floor featuring six trees.

3.2.3 Utilities

The proposed project would connect to the existing utilities located within Park Avenue and The Alameda. This would include the water and sanitary sewer lines in Park Avenue and storm drain line in The Alameda.

SECTION 4.0 ENVIRONMENTAL SETTING, CHECKLIST, AND IMPACT DISCUSSION

This section presents the discussion of impacts related to the following environmental subjects in their respective subsections:

4.1	Aesthetics	4.12	Mineral Resources
4.2	Agriculture and Forestry Resources	4.13	Noise
4.3	Air Quality	4.14	Population and Housing
4.4	Biological Resources	4.15	Public Services
4.5	Cultural Resources	4.16	Recreation
4.6	Energy	4.17	Transportation
4.7	Geology and Soils	4.18	Tribal Cultural Resources
4.8	Greenhouse Gas Emissions	4.19	Utilities and Service Systems
4.9	Hazards and Hazardous Materials	4.20	Wildfire
4.10	Hydrology and Water Quality	4.21	Mandatory Findings of Significance
4.11	Land Use and Planning		

The discussion for each environmental subject includes the following subsections:

- **Environmental Setting** – This subsection 1) provides a brief overview of relevant plans, policies, and regulations that compose the regulatory framework for the project and 2) describes the existing, physical environmental conditions at the project site and in the surrounding area, as relevant.
- **Impact Discussion** – This subsection 1) includes the recommended checklist questions from Appendix G of the CEQA Guidelines to assess impacts and 2) discusses the project's impact on the environmental subject as related to the checklist questions. For significant impacts, feasible mitigation measures are identified. "Mitigation measures" are measures that will minimize, avoid, or eliminate a significant impact (CEQA Guidelines Section 15370). Each impact is numbered to correspond to the checklist question being answered. For example, Impact BIO-1 answers the first checklist question in the Biological Resources section. Mitigation measures are also numbered to correspond to the impact they address. For example, MM BIO-1.3 refers to the third mitigation measure for the first impact in the Biological Resources section.

4.1 AESTHETICS

4.1.1 Environmental Setting

4.1.1.1 *Regulatory Framework*

State

Senate Bill 743

Senate Bill (SB) 743 was adopted in 2013 and requires lead agencies to use alternatives to level of service (LOS) for evaluating transportation impacts, specifically vehicle miles traveled (VMT). SB 743 also included changes to CEQA that apply to transit-oriented developments, as related to aesthetics and parking impacts. Under SB 743, a project's aesthetic impacts will no longer be considered significant impacts on the environment if:

- The project is a residential, mixed-use residential, or employment center project, and
- The project is located on an infill site within a transit priority area.[1]

SB 743 also clarifies that local governments retain their ability to regulate a project's aesthetics impacts outside of the CEQA process.

Streets and Highway Code Sections 260 through 263

The California Scenic Highway Program (Streets and Highway Code, Sections 260 through 263) is managed by the California Department of Transportation (Caltrans). The program is intended to protect and enhance the natural scenic beauty of California highways and adjacent corridors through special conservation treatment. There are no state-designated scenic highways in Santa Clara. Interstate 280 from the San Mateo County line to State Route (SR) 17, which includes segments in Santa Clara is an eligible, but not officially designated, State Scenic Highway.[2]

In Santa Clara County, the one state-designated scenic highway is SR 9 from the Santa Cruz County line to the Los Gatos City Limit. Eligible State Scenic Highways (not officially designated) include: SR 17 from the Santa Cruz County line to SR 9, SR 35 from Santa Cruz County line to SR 9,

[1] An "infill site" is defined as "a lot located within an urban area that has been previously developed, or on a vacant site where at least 75 percent of the perimeter of the site adjoins, or is separated only by an improved public right-of-way from, parcels that are developed with qualified urban uses." A "transit priority area" is defined as "an area within 0.5 mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to Section 450.216 or 450.322 of Title 23 of the Code of Federal Regulations." A "major transit stop" means "a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods." Source: Office of Planning and Research. "Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA." January 20, 2016. Accessed July 6, 2022. https://www.opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf.

[2] California Department of Transportation. "Scenic Highways." Accessed July 6, 2022. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways.

Interstate 280 from the San Mateo County line to SR 17, and the entire length of SR 152 within the County.

Local

Santa Clara General Plan

The following General Plan policies related to aesthetics are applicable to the proposed project.

Policies	Description
5.3.1-P3	Support high quality design consistent with adopted design guidelines and the City's architectural review process.
5.3.1-P10	Provide opportunities for increased landscaping and trees in the community, including requirements for new development to provide street trees and a minimum 2:1 on- or off-site replacement for trees removed as part of the proposal to help increase the urban forest and minimize the heat island effect.
5.3.1-P28	Encourage undergrounding of new utility lines and utility equipment throughout the City.
5.3.4-P8	Encourage building heights of up to five stories in large mixed-use developments along arterial street frontages, with the potential for taller buildings north of the Caltrain corridor.
5.3.4-P10	Require parking to be substantially below-grade or in structures with active uses along streets.
5.3.4-P12	Prioritize pedestrian-oriented streetscape and building design in mixed-use development, including features such as wider sidewalks, street furniture, specialty planters, signage, public art, street trees, special paving materials, decorative awnings, enhanced entrances, colors, variety of materials, and textures and distinctive building massing and articulation.

4.1.1.2 *Existing Conditions*

Project Site

The project site is located in an urbanized area and is a vacant lot that was previously occupied by a gas station. The lot is located on the southern corner of the intersection of Park Avenue and The Alameda. The site is not landscaped and contains only weeds and other grasses. The site is fenced in for security. Views of the site can be seen in Photos 1-4.

Surrounding Area

The project site is located adjacent to commercial developments, a residential neighborhood, and student residences for Santa Clara University. The surrounding commercial buildings are one to two stories and feature light colored stucco and brick and have red shingled rooftops or flat roofing with no shingles. The single-family houses to the west of the project are also one to two stories. The Santa Clara University housing buildings are four stories and feature stucco facades and red tile-shingle rooftops. Views of the surrounding area can be seen in Photos 5-8.



Photo 1



Photo 2



Photo 3



Photo 4

PHOTOS 1-4: VIEWS OF PROJECT SITE



Photo 5



Photo 6



Photo 7



Photo 8

PHOTOS 5-8: VIEWS OF SURROUNDING AREAS

4.1.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
1) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
3) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? [3] If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
4) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Impact AES-1:	**The project would not have a substantial adverse effect on a scenic vista. (No Impact)**

According to the 2010-2035 General Plan EIR, there are no scenic vistas within the City of Santa Clara. Therefore, the proposed project would not affect any existing scenic vistas because they are not present near the project site and there would be no impact as a result of the project.

Impact AES-2:	**The project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. (Less than Significant Impact)**

Impact AES-3:	**The project would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. The project would not conflict with applicable zoning and other regulations governing scenic quality. (Less than Significant Impact)**

Impact AES-4:	**The project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. (Less than Significant Impact)**

[3] Public views are those that are experienced from publicly accessible vantage points.

The project site is located within an urban area, that was previously developed with gas station and is considered an infill site. The project site is also located within a half mile of bus stops at the Santa Clara Transit Station served by the Route 22 (Palo Alto Transit Center – Eastridge), Route 60 (Milpitas BART – Winchester Station via SJC Airport), Route 53 (Sunnyvale Transit Center – Santa Clara Transit Center), Rapid 522 (Palo Alto Transit Center – Eastridge), and Route 59 (Steens Creek & Saratoga – Baypointe Station via Alviso) buses, three of which (22, 60, and Rapid 522) have commuter headways of 15 minutes or less. Due to the proximity to transit access, the site would be classified as within a transit priority area. Under SB 743, a project's aesthetic impacts would be less than significant if a project is a residential, mixed-use residential, or employment center project located on an infill site within a transit priority area. Therefore, because the proposed project would be located within a half mile of transit and would be classified as urban infill, the proposed project would be consistent with SB 743 and would result in less than significant aesthetic impacts.

4.2 AGRICULTURE AND FORESTRY RESOURCES

4.2.1 Environmental Setting

4.2.1.1 *Regulatory Framework*

State

Farmland Mapping and Monitoring Program

The California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) assesses the location, quality, and quantity of agricultural land and conversion of these lands over time. Agricultural land is rated according to soil quality and irrigation status. The best quality land is called Prime Farmland. In CEQA analyses, the FMMP classifications and published county maps are used, in part, to identify whether agricultural resources that could be affected are present on-site or in the project area.[4]

California Land Conservation Act

The California Land Conservation Act (Williamson Act) enables local governments to enter into contracts with private landowners to restrict parcels of land to agricultural or related open space uses. In return, landowners receive lower property tax assessments. In CEQA analyses, identification of properties that are under a Williamson Act contract is used to also identify sites that may contain agricultural resources or are zoned for agricultural uses.[5]

Fire and Resource Assessment Program

The California Department of Forestry and Fire Protection (CAL FIRE) identifies forest land, timberland, and lands zoned for timberland production that can (or do) support forestry resources.[6] Programs such as CAL FIRE's Fire and Resource Assessment Program are used to identify whether forest land, timberland, or timberland production areas that could be affected are located on or adjacent to a project site.[7]

[4] California Department of Conservation. "Farmland Mapping and Monitoring Program." Accessed July 6, 2022. http://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx.
[5] California Department of Conservation. Accessed July 6, 2022. "Williamson Act." http://www.conservation.ca.gov/dlrp/lca.
[6] Forest Land is land that can support 10 percent native tree cover and allows for management of forest resources (California Public Resources Code Section 12220(g)); Timberland is land not owned by the federal government or designated as experimental forest land that is available for, and capable of, growing trees to produce lumber and other products, including Christmas trees (California Public Resources Code Section 4526); and Timberland Production is land used for growing and harvesting timber and compatible uses (Government Code Section 51104(g)).
[7] California Department of Forestry and Fire Protection. "Fire and Resource Assessment Program." Accessed July 6, 2022. http://frap.fire.ca.gov/.

4.2.1.2 *Existing Conditions*

The project site is classified as Urban and Built-Up Land on the California Department of Conservation Farmland Mapping and Monitoring Program. The project site does not contain agricultural resources or timberland resources and is not under an existing Williamson Act contract.[8]

4.2.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
2) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
3) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
4) Result in a loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
5) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Impact AG-1: The project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use. (No Impact)

The project site is not listed as agricultural land of any type and is not identified as Farmland of Statewide Importance. The site was previously developed, and the proposed project would not convert any agricultural land to a non-agricultural use. Therefore, the proposed project would have no impact on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on

[8] County of Santa Clara. Williamson Act Properties Geodatabase. Accessed June 9, 2022. https://sccplanning.maps.arcgis.com/apps/webappviewer/index.html?id=1f39e32b4c0644b0915354c3e59778ce.

the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency.

Impact AG-2:	**The project would not conflict with existing zoning for agricultural use, or a Williamson Act contract. (No Impact)**

The project site is zoned Neighborhood Commercial. The existing zoning does not include agricultural use and the project site is not under a Williamson Act contract. Therefore, the proposed project would not conflict with an existing agricultural use or Williamson Act contract.

Impact AG-3:	**The project would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production. (No Impact)**

The project site is zoned Neighborhood Commercial. The existing zoning does not include forest land, timberland, or timberland zoned Timberland Production. Therefore, the proposed project would not conflict with existing contract forest land, timberland, or Timberland Production zoning.

Impact AG-4:	**The project would not result in a loss of forest land or conversion of forest land to non-forest use. (No Impact)**

The project site is not listed as forest land of any type. The site was previously developed, and the proposed project would not convert this area to a non-forest use. Therefore, the proposed project would have no impact on forest land and would not result in the loss of this resource.

Impact AG-5:	**The project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use. (No Impact)**

The project site is in a fully urbanized area with no agricultural areas or forest land nearby. The proposed project would not result in the conversion of agricultural or forest land surrounding the project site to non-agricultural or non-forest uses. Therefore, the project would have no impact on surrounding agricultural or forest resources.

4.3 AIR QUALITY

The information in this section is based in part on the information included in the 2655 The Alameda Residential Development Construction Community Risk Assessment prepared by Illingworth and Rodkin Inc. on September 21, 2022. This study is included as Appendix A of this document.

4.3.1 Environmental Setting

4.3.1.1 *Background Information*

Criteria Pollutants

Air quality in the Bay Area is assessed related to six common air pollutants (referred to as criteria pollutants), including ground-level ozone (O_3), nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO), sulfur oxides (SO_x), and lead.[9] Criteria pollutants are regulated because they result in health effects. An overview of the sources of criteria pollutants and their associated health are summarized in Table 4.3-1. The most commonly regulated criteria pollutants in the Bay Area are discussed further below.

Table 4.3-1: Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Ozone (O_3)	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	• Aggravation of respiratory and cardiovascular diseases • Irritation of eyes • Cardiopulmonary function impairment
Nitrogen Dioxide (NO_2)	Motor vehicle exhaust, high temperature stationary combustion and atmospheric reactions	• Aggravation of respiratory illness • Reduced visibility
Fine Particulate Matter ($PM_{2.5}$) and Coarse Particulate Matter (PM_{10})	Stationary combustion of solid fuels, construction activities, industrial processes and atmospheric chemical reactions	• Reduced lung function, especially in children • Aggravation of respiratory and cardiorespiratory diseases • Increased cough and chest discomfort • Reduced visibility
Toxic Air Contaminants (TACs)	Cars and trucks, especially diesel-fueled; industrial sources, such as chrome platers; dry cleaners and service stations; building materials and products	• Cancer • Chronic eye, lung, or skin irritation • Neurological and reproductive disorders

High O_3 levels are caused by the cumulative emissions of reactive organic gases (ROG) and NO_x. These precursor pollutants react under certain meteorological conditions to form high O_3 levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to

[9] The area has attained both state and federal ambient air quality standards for CO. The project does not include substantial new emissions of sulfur dioxide or lead. These criteria pollutants are not discussed further.

reduce O_3 levels. The highest O_3 levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources.

PM is a problematic air pollutant of the Bay Area. PM is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide emissions and localized emissions.

Toxic Air Contaminants

TACs are a broad class of compounds known to have health effects. They include but are not limited to criteria pollutants. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, diesel fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway).

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs. Diesel exhaust is a complex mixture of gases, vapors, and fine particles. Medium- and heavy-duty diesel trucks represent the bulk of DPM emissions from California highways. The majority of DPM is small enough to be inhaled into the lungs. Most inhaled particles are subsequently exhaled, but some deposit on the lung surface or are deposited in the deepest regions of the lungs (most susceptible to injury).[10] Chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the California Air Resources Board (CARB).

Sensitive Receptors

Some groups of people are more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, 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.

4.3.1.2 *Regulatory Framework*

Federal and State

Clean Air Act

At the federal level, the United States Environmental Protection Agency (EPA) is responsible for overseeing implementation of the Clean Air Act and its subsequent amendments. The federal Clean Air Act requires the EPA to set national ambient air quality standards for the six common criteria pollutants (discussed previously), including PM, O_3, CO, SO_x, NO_x, and lead.

[10] California Air Resources Board. "Overview: Diesel Exhaust and Health." Accessed July 11, 2022. https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health.

CARB is the state agency that regulates mobile sources throughout the state and oversees implementation of the state air quality laws and regulations, including the California Clean Air Act. The EPA and the CARB have adopted ambient air quality standards establishing permissible levels of these pollutants to protect public health and the climate. Violations of ambient air quality standards are based on air pollutant monitoring data and are determined for each air pollutant. Attainment status for a pollutant means that a given air district meets the standard set by the EPA and/or CARB.

Risk Reduction Plan

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, the plan involves application of emission control strategies to existing diesel vehicles and equipment to reduce DPM (in additional to other pollutants). Implementation of this plan, in conjunction with stringent federal and CARB-adopted emission limits for diesel fueled vehicles and equipment (including off-road equipment), will significantly reduce emissions of DPM and NO_X.

Regional and Local

City of Santa Clara Climate Action Plan

The City of Santa Clara Climate Action Plan 2022 (2022 CAP) is the latest update to the City's CAP and is designed to meet the statewide Greenhouse Gas (GHG) reduction targets for 2030 set by Senate Bill 32. As a Qualified Climate Action Plan, the 2022 CAP allows for tiering and streamlining of GHG analyses under CEQA. The 2022 CAP identifies existing City policies and regulations as well as new measures to be implemented by development projects in the areas of building/energy use, transportation/land use, materials/ consumption, natural resources & water resources, and community resilience & wellbeing. Projects that comply with the policies and strategies outlined in the 2022 CAP would have a less than significant GHG impact.

2017 Clean Air Plan

The Bay Area Air Quality Management District (BAAQMD) is the agency primarily responsible for assuring that the federal and state ambient air quality standards are maintained in the San Francisco Bay Area. Regional air quality management districts, such as BAAQMD, must prepare air quality plans specifying how state and federal air quality standards will be met. BAAQMD's most recently adopted plan is the Bay Area 2017 Clean Air Plan (2017 CAP). The 2017 CAP focuses on two related BAAQMD goals: protecting public health and protecting the climate. To protect public health, the 2017 CAP describes how BAAQMD will continue its progress toward attaining state and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities. To protect the climate, the 2017 CAP includes control measures designed to reduce emissions of methane and other super GHGs that are potent climate pollutants in the near-term, and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.[11]

[11] BAAQMD. *Final 2017 Clean Air Plan.* April 19, 2017. http://www.baaqmd.gov/plans-and-climate/air-quality-plans/current-plans.

CEQA Air Quality Guidelines

The BAAQMD CEQA Air Quality Guidelines are intended to serve as a guide for those who prepare or evaluate air quality impact analyses for projects and plans in the San Francisco Bay Area. Jurisdictions in the San Francisco Bay Area Air Basin utilize the thresholds and methodology for assessing air quality impacts developed by BAAQMD within their CEQA Air Quality Guidelines. The guidelines include information on legal requirements, BAAQMD rules, methods of analyzing impacts, and recommended mitigation measures.

Santa Clara General Plan

General Plan policies related to air quality that are applicable to the project include the following.

Policies	Description
5.10.2-G1	Improved air quality in Santa Clara and the region.
5.10.5-G2	Reduced greenhouse gas emissions that meet the State and regional goals and requirements to combat climate change
5.10.5-P3	Encourage implementation of technological advances that minimize public health hazards and reduce the generation of air pollutants.
5.10.5-P4	Encourage measures to reduce greenhouse gas emissions to reach 30 percent below 1990 levels by 2020.
5.10.5-P6	Require "Best Management Practices" for construction dust abatement.

4.3.1.3 *Existing Conditions*

The Bay Area is considered a non-attainment area for ground-level O_3 and $PM_{2.5}$ under both the federal Clean Air Act and state Clean Air Act. The area is also considered nonattainment for PM_{10} under the state act, but not the federal act. The area has attained both state and federal ambient air quality standards for CO. As part of an effort to attain and maintain ambient air quality standards for O_3 and PM_{10}, BAAQMD has established thresholds of significance for these air pollutants and their precursors. These thresholds are for O_3 precursor pollutants (ROG and NO_X), PM_{10}, and $PM_{2.5}$, and apply to both construction period and operational period impacts. The site is vacant and does not currently generate air quality emissions.

Sensitive Receptors

The closest sensitive receptors to the project site are the residents in the single-family houses to the west, the student housing for Santa Clara University to the east, and the Kids On Campus Preschool to the north of the project site. Additional sensitive receptors are located at further distances surrounding the site. Location of sensitive receptors can be seen in Figure 4.3-1 below.

4.3.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
2) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
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?	☐	☐	☒	☐

Note: Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the determinations.

Impacts from the Project

As discussed in CEQA Guidelines Section 15064(b), the determination of whether a project may have a significant effect on the environment calls for judgment on the part of the lead agency and must be based to the extent possible on scientific and factual data. The City of Santa Clara has considered the air quality thresholds updated by BAAQMD in May 2017 and regards these thresholds to be based on the best information available for the San Francisco Bay Area Air Basin and conservative in terms of the assessment of health effects associated with TACs and $PM_{2.5}$. The BAAQMD CEQA Air Quality thresholds used in this analysis are identified in Table 4.3-2 below.

Table 4.3-2: BAAQMD Air Quality Significance Thresholds			
Pollutant	**Construction Thresholds**	**Operation Thresholds**	
	Average Daily Emissions (pounds/day)	**Average Daily Emissions (pounds/day)**	**Annual Average Emissions (tons/year)**
Criteria Air Pollutants			
ROG, NO_x	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
CO	Not Applicable	9.0 ppm (eight-hour) or 20.0 ppm (one-hour)	
Fugitive Dust	Dust Control Measures/Best Management Practices	Not Applicable	
Health Risks and Hazards for New Sources (within a 1,000-foot Zone of Influence)			
Health Hazard	**Single Source**	**Combined Cumulative Sources**	
Excess Cancer Risk	10 per one million	100 per one million	
Hazard Index	1.0	10.0	
Incremental Annual $PM_{2.5}$	0.3 $\mu g/m^3$	0.8 $\mu g/m^3$ (average)	



Source: Illingworth & Rodkin, Inc., September 21, 2022.

LOCATION OF SENSITIVE RECEPTORS | FIGURE 4.3-1

Impact AIR-1: The project would not conflict with or obstruct implementation of the applicable air quality plan. (Less than Significant Impact)

Plan Consistency

As demonstrated below in Table 4.3-3 and 4.3-4 below, the proposed project would not result in construction or operational criteria pollutant emissions which exceed BAAQMD CEQA Air Quality Guidelines Operational Criteria Pollutant impact thresholds. The proposed project, therefore, would not conflict with the 2017 CAP because it would result in emissions lower than the BAAQMD thresholds (shown in Table 4.3-2), is considered urban infill, and would be located near bike paths and transit with regional connections. Because the project would not exceed the BAAQMD impact thresholds, it would not result in the generation of operational-related criteria air pollutants and/or precursors that exceed the thresholds shown in Table 4.3-2. Thus, the project is not required to incorporate project-specific control measures listed in the 2017 CAP. Further, implementation of the project would not inhibit BAAQMD or partner agencies from continuing progress toward attaining state and federal air quality standards and eliminating health-risk disparities from exposure to air pollution among Bay Area communities, as described within the 2017 CAP.

Construction Period Emissions – Criteria Pollutants

Construction of the proposed project has an estimated start date of September 2023 and an estimated construction period of 17 months (approximately 375 construction days). During construction, worker trips, on-site construction operations, and truck traffic would contribute to criteria pollutants in the area of the project site. Construction emissions for the proposed project are summarized in Table 4.3-3.

Table 4.3-3 Construction Criteria Air Pollutants Emissions

Construction Emissions Per Year (Tons)				
Year	**ROG**	**NOx**	**PM10 Exhaust**	**PM2.5 Exhaust**
2023	0.01	0.09	0.01	0.00
2024-2025	0.27	0.50	0.03	0.02
Average Daily Construction Emissions Per Year (pounds/day)				
2023 (84 days)	0.25	2.21	0.12	0.09
2024-2025 (291 days)	1.87	3.43	0.18	0.15
Total Construction	2.12	5.65	0.31	0.25
Thresholds (lbs/day)	54.0	54.0	82.0	54.0
Threshold Exceeded?	**No**	**No**	**No**	**No**

Source: Illingworth and Rodkin. 2655 The Alameda Residential Development Construction Community Risk Assessment. September 21, 2022.

The ROG, NOx and exhaust PM emissions during construction would not exceed the established BAAQMD thresholds for environmental impact. Therefore, the proposed project would result in a less than significant criteria pollutant emissions impact during construction of the proposed project.

Operational Period Emissions – Criteria Pollutants

During operations of the proposed project, the project would generate emissions from vehicle trips and building operations. The modeled emissions for the proposed project operations are included below in Table 4.3-4.

Table 4.3-4 Operational Criteria Air Pollutants Emissions				
Year	**ROG**	**NOx**	**Total PM10**	**Total PM2.5**
Operational Year 2025	0.26	0.08	0.15	0.04
Threshold - Tons/year	10.0	10.0	150	10.0
Average Daily Emissions (lbs/day)				
Operational Year 2025	1.44	0.45	0.81	0.21
Threshold – lbs/day	54.0	54.0	82.0	54.0
Thresholds Exceeded?	**No**	**No**	**No**	**No**
Source: Illingworth and Rodkin. 2655 The Alameda Residential Development Construction Community Risk Assessment. September 21, 2022.				

Operation of the proposed project would not contribute enough trips to considerably increase emissions from operational sources in the project area. Therefore, the proposed project would result in a less than significant operational criteria pollutants impact.

Impact AIR-2: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. (Less than Significant Impact)

The Bay Area is considered a non-attainment area for ground-level O_3 and $PM_{2.5}$ under both the federal Clean Air Act and state Clean Air Act. The proposed project would increase criteria pollutants in the Bay Area, contributing to existing violations of O_3 standards. Per the BAAQMD CEQA Air Quality Guidelines, air pollution by its nature is largely a cumulative impact. No single project is sufficient in size by itself, to result in nonattainment of ambient air quality standards. 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. As discussed above, the proposed project would not result in any air criteria pollutant emissions exceeding BAAQMD's significance thresholds. As a result, the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment.

Impact AIR-3: As mitigated, the project would not expose sensitive receptors to substantial pollutant concentrations. (Less than Significant Impact with Mitigation Incorporated)

Construction Dust Emissions

During construction, the proposed project would result in dust from vehicles and other construction activities. Based on the estimates in the Community Risk Assessment, the fugitive dust emissions for the construction of the proposed project were determined to be less than 0.01 tons (equivalent to one

pound) for the entirety of the construction period. The proposed project would be required to implement BAAQMD Standard Construction Procedures to limit the dispersion of particulate matter during construction.

Condition of Approval

During any construction period of ground disturbance, the applicant shall ensure that the project contractor implement measures to control dust and exhaust. Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a less than significant level. Additional measures are identified to reduce construction equipment exhaust emissions. The contractor shall implement the following best management practices that are required of all projects:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- 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.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
- 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.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number project construction superintendent regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall be visible to ensure compliance with applicable regulations.

With implementation of the BAAQMD recommended basic control measures, the fugitive particulate matter produced by the proposed project would result in less than significant impact.

Construction Toxic Air Contaminants

Construction of the proposed project would result in the release of emissions known to result in greater occurrences of cancer and other health conditions. The Air Quality Assessment analyzed infant and adult exposures to TACs at all the residences surrounding the project site. Infant exposure at residences was used as a worst-case assumption because child and adult exposures would be less severe. The results of the modeling conducted as a part of the Air Quality Assessment are summarized below in Table 4.3-5.

Table 4.3-5 Construction TAC Risks			
Source	**Cancer Risk**	**Annual PM 2.5**	**Hazard Index**
Maximally Effected Individual -			
Project Construction	**23.09 (infant)**	0.06	0.01
BAAQMD Threshold	10	0.3	1.0
Exceed Threshold?	**Yes**	No	No
Most Affected Residential Receptor - First Floor University Housing Across the Alameda			
Project Construction	5.44 (Infant)	0.03	0.01
BAAQMD Threshold	10	0.3	1.0
Exceed Threshold?	No	No	No
Source: Illingworth and Rodkin. 2655 The Alameda Residential Development Construction Community Risk Assessment. September 21, 2022.			

The proposed project would result in an exceedance of the BAAQMD threshold for infant cancer risk.

IMPACT AIR-3.1 The proposed project would exceed the Cancer Risk Threshold of 10 cases per million during construction of the project.

Mitigation Measures

The following measure will be required to be implemented during all phases of construction.

MM-AIR 3.1-1 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 PM (PM_{10} and $PM_{2.5}$).

If Tier 4 equipment is not available, alternatively the project will use equipment that meets U.S. EPA emission standards for Tier 3 engines and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices that altogether achieve a 60 percent reduction in particulate matter exhaust in comparison to uncontrolled equipment; alternatively (or in combination).

Alternatively, the applicant may develop a construction operations plan demonstrating that the construction equipment used on-site would achieve a reduction in construction diesel particulate matter emissions by 60 percent or greater. Elements of the plan could include a combination of the following measures:

- Use of Tier 4 engines or alternatively fueled equipment,
- Installation of electric power lines during early construction phases to avoid use of diesel generators and compressors,
- Use of electrically-powered equipment,
- Forklifts and aerial lifts used for exterior and interior building construction shall be electric,

- Change in construction build-out plans to lengthen phases, and
- Implementation of different building techniques that result in less diesel equipment usage.
- Such a construction operations plan would be subject to review by an air quality expert and approved by the City prior to construction.

The project applicant shall submit a construction operations plan prepared by an air quality professional that outlines how the construction contractor will achieve the measures outlined above. The plan shall be submitted to the Director of Community Development for review and approval prior to issuance of any demolition, grading, and/or building permits (whichever occurs earliest).

Through implementation of MM-AIR 3.1-1, the proposed project would reduce the cancer risk associated with the proposed project to 1.83 cases per million which is below the threshold of 10 per million. Additionally, the Annual $PM_{2.5}$ would be reduced to 0.01ug/m^3 and the Hazard Index would be reduced to less than 0.01. These levels would all be below the BAAQMD thresholds. Therefore, with mitigation incorporated the proposed project would result in less than significant construction TAC impacts.

Operational Community Risk Impacts

Stationary equipment that could emit substantial TACs (e.g., emergency generators) are not proposed as part of the project. Operation of the project would, however, have long-term emissions from mobile sources (i.e., traffic). Based on CalEEMod default trip generation data, this project would generate 214 daily trips dispersed on the roadway system, with a majority of the trips being from light-duty vehicles (i.e., passenger automobiles). Passenger automobiles and trucks are not significant sources of TAC's because they are not primarily diesel vehicles. Therefore, operational emissions of TACs from the project would be negligible and would result in a less than significant impact.

Impact AIR-4:	**The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. (Less than Significant Impact)**

The proposed project would introduce a mixed-use residential and commercial development to the project site which is currently vacant. During construction of the proposed project, operation of construction vehicles may result in temporary odors related to fuel combustion, but these would be temporary and would not result in a significant impact. The mixed-use development would not produce emissions which would create unpleasant odors for residents around the project site. Therefore, the proposed project would have a less than significant impact from odors produced on-site.

4.3.3 Non-CEQA Effects

Per *California Building Industry Association v. Bay Area Air Quality Management District,* 62 Cal. 4th 369 *(BIA v. BAAQMD),* effects of the environment on the project are not considered CEQA

impacts. The following discussion is included for informational purposes only because the City of Santa Clara has policies that address existing air quality conditions affecting a proposed project.

A Health Risk Assessment (included as part of Appendix A) was completed to determine if existing TAC sources would have cause a health risk to the new sensitive receptors (residents) that the project would create. The TAC sources near the project site, including El Camino Real and generators located on the Santa Clara University campus, were used in this health risk assessment.

Maximum increased cancer risks were calculated for the future residents of the project site using the maximum modeled TAC concentrations. A 30-year exposure period was used in calculating cancer risks assuming the residents would include women in the third trimester of pregnancy and infants/children and were assumed to be in the new housing areas for 24 hours per day for 350 days per year.

The highest concentrations of pollutants would occur at the first-floor receptor at the southeastern corner of the site. Cancer risks and annual $PM_{2.5}$ concentrations associated with El Camino Real and the nearby generators are greatest nearest to the source and decrease with distance. The surrounding sources of TAC were determined to not exceed BAAQMD thresholds and would not represent a significant source of health hazard for the new residents of the proposed project. The community risk at the project site is shown in Table 4.3-6.

Table 4.3-6 Impacts from Combined Sources to Project Site Receptors

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
El Camino Real, ADT 23,733	0.04	<0.01	<0.01
Santa Clara University (Facility ID #15397_1, Generator), MEI at 1,000 feet	0.13	<0.01	<0.01
Santa Clara University (Facility ID #15397_10, Generator), MEI at 970 feet	0.17	<0.01	<0.01
Santa Clara University (Facility ID #15397_12, Generator), MEI at 950 feet	1.05	<0.01	<0.01
Santa Clara University (Facility ID #15397_13, Generator), MEI at 980 feet	0.29	<0.01	<0.01
Santa Clara University (Facility ID #15397_14, Generator), MEI at 910 feet	0.10	<0.01	<0.01
Santa Clara University (Facility ID #15397_16, Generator), MEI at 970 feet	0.26	<0.01	<0.01
Santa Clara University (Facility ID #15397_18, Generator), MEI at 510 feet	026	<0.01	<0.01
Santa Clara University (Facility ID #15397_19, Generator), MEI at 760 feet	0.11	<0.01	<0.01
Santa Clara University (Facility ID #15397_21, Generator), MEI at 3700 feet	0.21	<0.01	<0.01
Santa Clara University (Facility ID #15397_23, Generator), MEI at 575 feet	0.13	<0.01	<0.01
BAAQMD Single Source Threshold	**10**	**0.3**	**1.0**
Exceed Threshold?	No	No	No

Cumulative Total	2.75	<0.11	<0.11
BAAQMD Cumulative Source threshold	**100**	**0.8**	**10.0**
Exceed Threshold?	No	No	No
Source: Illingworth and Rodkin. 2655 The Alameda Residential Development Construction Community Risk Assessment. September 21, 2022.			

Therefore, because the proposed project would not exceed the BAAQMD thresholds for TACs, the proposed project would be consistent with General Plan Policy 5.10.5-P3 for minimizing health hazards resulting from air pollutants in the city.

4.4 BIOLOGICAL RESOURCES

4.4.1 Environmental Setting

4.4.1.1 *Regulatory Framework*

Federal and State

Endangered Species Act

Individual plant and animal species listed as rare, threatened, or endangered under state and federal Endangered Species Acts are considered special-status species. Federal and state endangered species legislation has provided the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Permits may be required from both the USFWS and CDFW if activities associated with a proposed project would result in the take of a species listed as threatened or endangered. To "take" a listed species, as defined by the State of California, is "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" these species. Take is more broadly defined by the federal Endangered Species Act to include harm of a listed species.

In addition to species listed under state and federal Endangered Species Acts, Sections 15380(b) and (c) of the CEQA Guidelines provide that all potential rare or sensitive species, or habitats capable of supporting rare species, must be considered as part of the environmental review process. These may include plant species listed by the California Native Plant Society and CDFW-listed Species of Special Concern.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) prohibits killing, capture, possession, or trade of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. Hunting and poaching are also prohibited. The taking and killing of birds resulting from an activity is not prohibited by the MBTA when the underlying purpose of that activity is not to take birds.[12] Nesting birds are considered special-status species and are protected by the USFWS. The CDFW also protects migratory and nesting birds under California Fish and Game Code Sections 3503, 3503.5, and 3800. The CDFW defines taking as causing abandonment and/or loss of reproductive efforts through disturbance.

Sensitive Habitat Regulations

Wetland and riparian habitats are considered sensitive habitats under CEQA. They are also afforded protection under applicable federal, state, and local regulations, and are generally subject to regulation by the United States Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), CDFW, and/or the USFWS under provisions of the federal Clean Water Act (e.g., Sections 303, 304, 404) and State of California Porter-Cologne Water Quality Control Act.

[12] United States Department of the Interior. "Memorandum M-37050. The Migratory Bird Treaty Act Does Not Prohibit Incidental Take." Accessed July 6, 2022. https://www.doi.gov/sites/doi.gov/files/uploads/m-37050.pdf.

Fish and Game Code Section 1602

Streambeds and banks, as well as associated riparian habitat, are regulated by the CDFW per Section 1602 of the Fish and Game Code. Work within the bed or banks of a stream or the adjacent riparian habitat requires a Streambed Alteration Agreement from the CDFW.

Santa Clara General Plan

General Plan policies relevant to the proposed project include the following:

Policies	Description
5.3.1-P10	Provide opportunities for increased landscaping and trees in the community, including requirements for new development to provide street trees and a minimum 2:1 on- or off-site replacement for trees removed as part of the proposal to help increase the urban forest and minimize the heat island effect.
5.10.1-P4	Protect all healthy cedars, redwoods, oaks, olives, bay laurel, and pepper trees of any size, and all other trees over 36 inches in circumference measured from 48 inches above-grade on private and public property, as well as in the public right-of-way.

4.4.1.2 *Existing Conditions*

The project site is located within the urbanized area of Santa Clara and does not contain natural habitats on or near the project site. Species on-site consist primarily of urban adapted animals and birds. The primary habitats provided on the project site are the weeds on-site which would provide space for small mammals. There is one tree on-site and the nearest riparian habitat is located approximately 1.5 miles east at the Guadalupe River.

4.4.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) 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 (CDFW) or United States Fish and Wildlife Service (USFWS)?	☐	☒	☐	☐
2) 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 CDFW or USFWS?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
3) 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?	☐	☐	☐	☒
4) 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?	☐	☐	☒	☐
5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Impact BIO-1: **As mitigated, the project would not 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 Impact with Mitigation Incorporated)**

The proposed project site does not contain sensitive habitat or special status species as identified in local plans, policies or regulations by the CDFW or USFWS.

Nesting Birds

The trees and shrubs near the project site could provide nesting habitat for birds, including migratory birds or raptors. Nesting birds are among the species protected under the provisions of the MBTA and California Fish and Game Code Sections 3503, 3503.5, and 2800. The project would remove the one tree from the project site. If construction occurs during the avian breeding season (February 1 through August 31), construction activities and removal of the tree during the nesting season could disturb adult birds to the point of abandonment of active nests in trees near the project site. Any loss of fertile eggs, nesting raptors, or any activities resulting in nest abandonment would constitute a significant impact under CDFW regulations.

Impact BIO-1.1: Construction activities could disrupt nesting raptors, or other birds, resulting in abandonment of nests and loss of fertile eggs.

Mitigation Measure: The following mitigation measure would be implemented during construction activities to avoid abandonment of raptor and other protected migratory bird nests:

MM-BIO 1.1-1: Construction shall be scheduled to avoid the nesting season to the extent feasible. The nesting season for most birds, including most raptors, in the San Francisco Bay Area extends from February 1st through August 31st.

If it is not possible to schedule construction and tree removal between September 1 and January 31, then pre-construction surveys for nesting birds shall be completed by a qualified ornithologist to ensure that no nests are disturbed during project implementation. This survey shall be completed no more than 14 days prior to the initiation of grading, tree removal, or other construction activities during the early part of the breeding season (February through April) and no more than 30 days prior to the initiation of these activities during the late part of the breeding season (May through August).

During this survey, the ornithologist shall inspect trees and other possible nesting habitats within and immediately adjacent to the construction area for nests. If an active nest is found sufficiently close to work areas to be disturbed by construction, the qualified ornithologist, shall determine the extent of a construction-free buffer zone to be established around the nest to ensure that raptor or migratory bird nests would not be disturbed during project construction.

Implementation of MM-BIO 1.1-1 would reduce construction impacts to nesting birds to a less than significant level.

Impact BIO-2:	**The project would not 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 CDFW or USFWS. (No Impact)**

The project site does not contain riparian habitat or other sensitive natural communities. The weeds and grasses on-site do not provide habitat for sensitive species. Therefore, the proposed project would have no impact on riparian habitats or other sensitive natural communities.

Impact BIO-3:	**The project would not have a substantial adverse effect on state or federally protected wetlands through direct removal, filling, hydrological interruption, or other means. (No Impact)**

The project site does not contain state or federally protected wetlands nor are any wetland areas adjacent to the project site. Therefore, the proposed project would not have a substantial adverse effect on state or federally protected wetlands through direct removal, filling, hydrological interruption, or other means.

Impact BIO-4:	**The project would not 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 Impact)**

The proposed project is located in an urbanized area that does not serve as a migratory wildlife corridor or nursery site because it does not contain habitat features which provide uses for migratory bird species. Additionally, the project site is not located near streams or rivers that serve as corridors for migratory fish nor is it located in an area identified as a migratory wildlife corridor. Therefore, the proposed project would not interfere with movement of native or migratory species by impacting migratory corridors or nursery sites.

Impact BIO-5:	**The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant Impact)**

The proposed project would require the removal of the single ordinance sized tree from the project site, a London plane. The proposed project would plant six new trees on-site and add 13 new street trees on the sidewalks bounding the project site. The planting of new trees would be in compliance with local policies and ordinances protecting biological resources, including General Plan Policies 5.3.1-P10, 5.10.1-P4, and City Code (SCCC) chapter 12.35 which require the replacement of ordinance sized trees on-site at specific ratios depending on the size and species of tree. The trees included in the proposed project would replace the removed tree at a greater than 1:10 ratio which exceeds the requirements of the General Plan and City Code. Therefore, the 19 trees proposed for the project would comply with the requirements of the General Plan policy and the project would not conflict with local policies or ordinances protecting biological resources.

Impact BIO-6:	**The project would not 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 covered by a Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other conservation plan. Thus, the project would not conflict with any such plan and there would be no impact.

4.5 CULTURAL RESOURCES

The information in this section is based in part on the Archeological Sensitivity Study prepared for the proposed project by Archaeological/Historical Consultants in September 2022. This study is on file with the City of Santa Clara.

4.5.1 Environmental Setting

4.5.1.1 *Regulatory Framework*

Federal and State

National Historic Preservation Act

Federal protection is legislated by the National Historic Preservation Act of 1966 (NHPA) and the Archaeological Resource Protection Act of 1979. These laws maintain processes for determination of the effects on historical properties eligible for listing in the National Register of Historic Places (NRHP). Section 106 of the NHPA and related regulations (36 Code of Federal Regulations [CFR] Part 800) constitute the primary federal regulatory framework guiding cultural resources investigations and require consideration of effects on properties that are listed or eligible for listing in the NRHP. Impacts to properties listed in the NRHP must be evaluated under CEQA.

The NRHP is the nation's master inventory of historic resources that are considered significant at the national, state, or local level. The minimum criteria for determining NRHP eligibility include:

- The property is at least 50 years old (properties under 50 years of age that are of exceptional importance or are contributors to a district can also be included in the NRHP);
- It retains integrity of location, design, setting, materials, workmanship, feeling, and associations; and
- It possesses at least one of the following characteristics:
    - Association with events that have made a significant contribution to the broad patterns of history;
    - Association with the lives of persons significant in the past;
    - Distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant, distinguishable entity whose components may lack individual distinction; or
    - Has yielded, or may yield, information important to prehistory or history.

California Register of Historical Resources

The California Register of Historical Resources (CRHR) is administered by the State Office of Historic Preservation and encourages protection of resources of architectural, historical, archeological, and cultural significance. The CRHR identifies historic resources for state and local

planning purposes and affords protections under CEQA. Under Public Resources Code Section 5024.1(c), a resource may be eligible for listing in the CRHR if it meets any of the NRHP criteria.[13]

Historical resources eligible for listing in the CRHR must meet the significance criteria described previously and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if it maintains the potential to yield significant scientific or historical information or specific data.

The concept of integrity is essential to identifying the important physical characteristics of historical resources and, therefore, in evaluating adverse changes to them. Integrity is defined as "the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance." The processes of determining integrity are similar for both the CRHR and NRHP and use the same seven variables or aspects to define integrity that are used to evaluate a resource's eligibility for listing. These seven characteristics include 1) location, 2) design, 3) setting, 4) materials, 5) workmanship, 6) feeling, and 7) association.

California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural, and Sacred Sites Act applies to both state and private lands. The act requires that upon discovery of human remains, construction or excavation activity must cease and the county coroner be notified.

Public Resources Code Sections 5097 and 5097.98

Section 15064.5 of the CEQA Guidelines specifies procedures to be used in the event of an unexpected discovery of Native American human remains on non-federal land. These procedures are outlined in Public Resources Code Sections 5097 and 5097.98. These codes protect such remains from disturbance, vandalism, and inadvertent destruction, establish procedures to be implemented if Native American skeletal remains are discovered during construction of a project, and establish the Native American Heritage Commission (NAHC) as the authority to resolve disputes regarding disposition of such remains.

Pursuant to Public Resources Code Section 5097.98, in the event of human remains discovery, no further disturbance is allowed until the county coroner has made the necessary findings regarding the origin and disposition of the remains. If the remains are of a Native American, the county coroner must notify the NAHC. The NAHC then notifies those persons most likely to be related to the Native American remains. The code section also stipulates the procedures that the descendants may follow for treating or disposing of the remains and associated grave goods.

[13] California Office of Historic Preservation. "CEQA Guidelines Section 15064.5(a)(3) and California Office of Historic Preservation Technical Assistance Series #6." Accessed July 11, 2022. http://www.ohp.parks.ca.gov/pages/1069/files/technical%20assistance%20bulletin%206%202011%20update.pdf.

Local

Santa Clara General Plan

General Plan policies related to cultural resources and applicable to the project include the following.

Policy	Description
5.6.3-P1	Require that new development avoid or reduce potential impacts to archaeological, paleontological and cultural resources.
5.6.3-P4	Require that a qualified paleontologist/archaeologist monitor all grading and/or excavation if there is a potential to affect archeological or paleontological resources, including sites within 500 feet of natural water courses and the Old Quad neighborhood.
5.6.3-P5	In the event that archeological/paleontological resources are discovered, require that work be suspended until the significance of the find and recommended actions are determined by a qualified archeologist/paleontologist.
5.6.3-P6	In the event that human remains are discovered, work with the appropriate Native American representative and follow the procedures set forth in state law.

4.5.1.2 *Existing Conditions*

Archeological Sensitivity

Archaeological sites are most often found in flat locations with access to a perennial source of fresh water. Soils deposited during the Holocene era (from 11,700 years ago), especially young alluvium from the last 2,000-3,000 years, are more likely to contain buried archaeological deposits. In Santa Clara, Native American sites are most often found within 0.5 miles of major watercourses and 0.25 miles of minor watercourses.

Within the project area, the soil is Holocene alluvial fan deposits. In the early historic period, the nearest fresh water was a perennial pond located 420 feet to the east. The historical habitat of the area was wet meadow due to seasonal inundation by Saratoga Creek and Guadalupe River, which run nearby.

The project site is located on late Holocene-era fan deposit soils, on a flat slope, and has a perennial freshwater pond less than 500 feet away. As a result, the site is sensitive for buried Native American archaeological deposits based on geoarchaeological factors. In addition, there are two known Native American archaeological sites within 0.25 miles of its location, associated with the Mission Santa Clara complex and the Ohlone village which was present there prior to the Spanish arrival in California. The project area, therefore, has high sensitivity for Native American archaeological resources.

Historical Sensitivity

Immediately to the north of The Alameda was Rancho Potrero de Santa Clara. In 1851 Mission Santa Clara was handed over to the Jesuit order, who founded Santa Clara University, originally called “Santa Clara College,” on the land directly around Mission Santa Clara.

The triangular project area is approximately 0.3 miles south of the original Mission site. The 1876 Thompson and West Map shows the project area as part of the town of Santa Clara, with the 134.87-acre estate of John G. Bray (1814-1866) to the southeast. The project area was part of the J. Bray subdivision in an 1890's map.

From at least the 1880s, the project site and surrounding area was used to store and sell coal, and as a feed and flour mill. From 1892 through the closure of Pacific Manufacturing Company in 1960 it was also the site of a lumber mill and its auxiliary buildings. Sanborn Fire Insurance Maps show many structures in the project site and surrounding area, including the feed mill, coal storage, and outbuildings such as privies associated with Edward J. Baker's Santa Clara Feed Mill. At least one of Baker's buildings, the feed mill, appears to have been repurposed as a blacksmith and machine shop when the property was acquired by Pacific Manufacturing Company. This repurposed structure is visible on Sanborn Maps from 1887 to 1950.

Due to the historic use of the project site and surrounding areas, the project site has high sensitivity for historic-era archaeological deposits.

4.5.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?	☐	☐	☒	☐
2) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	☐	☒	☐	☐
3) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Impact CUL-1: The project would not cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5. (Less than Significant Impact)

There are no historic structures on-site and no structures near the project site are classified as historically significant. Based on this information the proposed project would not cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5.

Impact CUL-2:	**As mitigated, the project would not cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (Less than Significant Impact with Mitigation Incorporated)**

There are no recorded archeological sites located within the boundaries of the project site. However, as stated above, the site has had multiple historical uses and the project site has high sensitivity for historical archaeological resources. Additionally, the site was occupied by Native Americans and is located near multiple archaeological resources sites. Therefore, based on the findings of the Archeological Resources Report prepared for this project, the proposed project would have a potential significant impact on archaeological resources on the project site.

IMPACT CUL-2.1 The proposed project would require excavation of the site which could impact as yet unrecorded underground prehistoric and historic archaeological resources.

Mitigation Measures

MM-CUL 2.1-1 Prior to grading of the project site, a qualified archaeological consultant will conduct subsurface sampling of the following areas on-site to determine if historical archeological resources are present:

- outbuildings that are likely to be privies, as shown on the 1887, 1891, and 1915 Sanborn maps;
- building footprints as shown on the 1887, 1891, and 1915 Sanborn maps; and
- areas that were not developed in the historic era, since prehistoric archaeological deposits (if present) are less likely to be disturbed in these areas.

Testing for historic-era resources shall extend to a depth of four feet below the current ground surface. Testing for prehistoric resources shall extend to a depth of eight feet below the current ground surface to account for rapid alluviation during the Holocene era. In the event that resources are discovered on-site the site-specific cultural resources treatment plan shall be prepared and approved by the Director of Community Development prior to issuance of any of grading permits in conformance with the steps outlined below.

Investigation – Resource Identification

Archaeologists will investigate features to determine their potential significance. Decisions will be made about which features will be subject to archaeological data recovery.

- Determination of significance of historic archaeological property types is tied directly to their historical context and relevance to research themes further discussed below. Usefulness of a property type (feature) with regard to relevant research themes determines the legal importance of that resource. Also germane to the importance of property types are

assessments of integrity, land use history, and comparison with other known similar property types. Especially relevant here are issues that cannot be addressed using data from other sources. The purpose of identifying relevant research themes is to help predict areas of special concern, given expected property types. Determination of relevance to research themes is critical to the identification of significant features in the field.

- If data recovery is determined to be appropriate, excavation will target recovery of an appropriate amount of information from archaeological deposits to determine potential of the resource to address specific research questions. If it occurs, data recovery will emphasize understanding of the archaeological deposit's structure, including features and stratification, horizontal and vertical extent, and content including the nature and quantity of artifacts.

Reporting

The findings reports will follow the outline below and will focus on particular finds encountered during the excavation. All reports will at a minimum meet the Secretary of the Interior's Standards for Archaeological Documentation. The report will be submitted to the applicant and all reviewing agencies, and will ultimately be filed with the Northwest Information Center at Sonoma State University.

The technical report on project results may address the following elements:

- executive summary;
- statement of scope, including project location and setting;
- background contexts or summaries;
- summary of previous research, historical and archaeological;
- research goals and themes;
- field and laboratory methodologies;
- descriptions of recovered materials;
- findings and interpretations, referencing research goals;
- conclusions;
- references cited; and
- appendices such as artifact catalogs, special studies, and other information relevant to the project and findings.

MM-CUL 2.1-2 Upon completion of all field work, but before completion of the Findings Report (outlined in MM CUL-2.1), a preliminary report outlining the data recovery work on the site(s) shall be submitted to the Director of Community Development for review and approval prior to issuance of building permits.

With implementation of MM-CUL 2.1-1 and MM-CUL 2.1-2 The proposed project would identify and protect all archaeological resources on-site, which would reduce the impact on these resources to a less than significant level.

Impact CUL-3:	**The project would disturb human remains, including those interred outside of dedicated cemeteries, but with mitigation, the disturbance would be minimized and the impact reduced to less-than-significant. (Less than Significant Impact with Mitigation Incorporated)**

As stated above, implementation of the proposed project may discover and disturb previously unrecorded archeological resources. This would also apply to any human remains, including those interred outside of dedicated cemeteries because the project site is in close vicinity to the mission site.

Impact CUL-3.1 Construction activities could disturb human remains on-site.

Mitigation Measure

MM-CUL 3.1-1 In the event that human remains are discovered during archaeological testing or excavation, trenching and/or grading of the site, all activity within a 50-foot radius of the find shall be stopped. The Santa Clara County Coroner shall be notified and shall make a determination as to whether the remains are of Native American origin or whether an investigation into the cause of death is required. If the remains are determined to be Native American, the Coroner shall notify the Native American Heritage Commission (NAHC) immediately. Once NAHC identifies the most likely descendants, the descendants will make recommendations regarding proper burial, which will be implemented in accordance with Section 15064.5(e) of the CEQA Guidelines.

Discovery of Human Remains

Procedures for the treatment of human remains are well defined in various California laws and codes. The Heritage Commission acts as a central point of contact for notification of Native Americans, and arbitration between the Native American representative and the property owner (who is also the owner of the remains) and any associated archaeological materials. These procedures are set forth in the California Public Resources Code 5097.9, specifically 5097.98 Notification of discovery of Native American human remains, descendants, disposition of human remains and associated grave goods. NAHC guidelines have changed over time and the project proponent will follow NAHC recommendations and Public Resource Codes current at the time of the discovery.

- **Discovery.** When human remains are discovered (in either an archaeological or construction context), the project proponent will notify the Santa Clara County Coroner who will determine if the remains are or are suspected to be of Native American origin (cf. Section 7050.5c of the

Health and Safety Code). This is often done in consultation with the archaeological investigator or on occasion in consultation with a forensic or physical anthropologist. If this determination is made, the Coroner will notify the Heritage Commission.

- **Notification of Most Likely Descendent (MLD).** The Heritage Commission will notify those persons it believes are most likely descended from the deceased Native American. This is usually a single individual although for a number of reasons, the Heritage Commission may assign more than one MLD. The MLD will likely be on the original consultation list; however, this is not always the case, as some individuals have removed themselves from the general consultation list due to the number of requests for comments.
- **Inspection and Recommendations.** The MLD will have 48 hours to inspect the finds and make recommendations to the project proponent regarding the disposition of the remains. If the MLD fails to make a recommendation or the MLD and the project proponent fail to come to an agreement (with mediation provided by the NAHC) the project proponent will respectfully reinter the remains and associated artifacts in a safe place on project site.

With implementation of the above mitigation measures, the project would result in a less than significant impact on human remains.

4.6 ENERGY

4.6.1 Environmental Setting

4.6.1.1 *Regulatory Framework*

Federal and State

Energy Star and Fuel Efficiency

At the federal level, energy standards set by the Environmental Protection Agency (EPA) apply to numerous consumer products and appliances (e.g., the EnergyStar™ program). The EPA also sets fuel efficiency standards for automobiles and other modes of transportation.

Renewables Portfolio Standard Program

In 2002, California established its Renewables Portfolio Standard Program, with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent of retail sales by 2010. Governor Schwarzenegger issued Executive Order (EO) S-3-05, requiring statewide emissions reductions to 80 percent below 1990 levels by 2050. In 2008, EO S-14-08 was signed into law, requiring retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. In October 2015, Governor Brown signed SB 350 to codify California's climate and clean energy goals. A key provision of SB 350 requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from renewable sources by 2030. SB 100, passed in 2018, requires 100 percent of electricity in California to be provided by 100 percent renewable and carbon-free sources by 2045.

Executive Order B-55-18 To Achieve Carbon Neutrality

In September 2018, Governor Brown issued an executive order, EO-B-55-18 "To Achieve Carbon Neutrality", setting a statewide goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." The executive order requires CARB to "ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal." EO-B-55-18 supplements EO S-3-05 by requiring not only emissions reductions, but also that, by no later than 2045, the remaining emissions be offset by equivalent net removals of CO_2 from the atmosphere through sequestration.

California Building Standards Code

The Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6 of the California Code of Regulations (Title 24), was established in 1978 in response to a legislative mandate to reduce California's energy consumption. Title 24 is updated approximately every three years.[14] Compliance with Title 24 is mandatory at the time new building permits are issued by city and county governments.[15]

[14] California Building Standards Commission. "California Building Standards Code." Accessed July 11, 2022. https://www.dgs.ca.gov/BSC/Codes#@ViewBag.JumpTo.
[15] California Energy Commission (CEC). "2019 Building Energy Efficiency Standards." Accessed July 11, 2022. https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency.

California Green Building Standards Code

CALGreen establishes mandatory green building standards for buildings in California. CALGreen was developed to reduce GHG emissions from buildings, promote environmentally responsible and healthier places to live and work, reduce energy and water consumption, and respond to state environmental directives. CALGreen covers five categories: planning and design, energy efficiency, water efficiency and conservation, material and resource efficiency, and indoor environmental quality.

Advanced Clean Cars Program

CARB adopted the Advanced Clean Cars program in 2012 in coordination with the EPA and National Highway Traffic Safety Administration. The program combines the control of smog-causing pollutants and GHG emissions into a single coordinated set of requirements for vehicle model years 2015 through 2025. The program promotes development of environmentally superior passenger cars and other vehicles, as well as saving the consumer money through fuel savings.[16]

Local

Santa Clara General Plan

Energy-related General Plan policies applicable to the project are shown in the following table.

Policy	Description
5.10.3-P4	Encourage new development to incorporate sustainable building design, site planning and construction, including encouraging solar opportunities.
5.10.3-P5	Reduce energy consumption through sustainable construction practices, materials, and recycling.
5.10.3-P6	Promote sustainable buildings and land planning for all new development, including programs that reduce energy and water consumption in new development.

Santa Clara Reach Code

Reach Codes are local ordinances adopted by the local government that exceed and enhance the current version of state's Energy and Green Building standards codes. By adopting the City Reach Code ordinance, the City of Santa Clara utilized this opportunity to not only meet local climate action goals to reduce greenhouse gas emissions, but also to achieve greater energy savings and accelerate decarbonization through the all-electric requirements. Santa Clara Reach Code includes all-electric building electrification requirements and mandatory measures for Electrical Vehicle Charging are applicable to all new building permit applications filed with the City.

Construction and Demolition Debris Recycling Program

[16] California Air Resources Board. "The Advanced Clean Cars Program." Accessed July 11, 2022. https://www.arb.ca.gov/msprog/acc/acc.htm.

The City of Santa Clara requires applicants seeking building or demolition permits for projects greater than 5,000 square feet to recycle at least 65 percent of discards. Diversion is achieved through recycling or reuse.

4.6.1.2 *Existing Conditions*

Total energy usage in California was approximately 6,956.6 trillion British thermal units (Btu) in the year 2020, the most recent year for which this data was available.[17] Out of the 50 states, California is ranked second in total energy consumption and 49th in energy consumption per capita. The breakdown by sector was approximately 21 percent (1,507.7 trillion Btu) for residential uses, 19.6 percent (1,358.3 trillion Btu) for commercial uses, 24.6 percent (1,701.2 trillion Btu) for industrial uses, and 34 percent (2,355.5 trillion Btu) for transportation.[18] This energy is primarily supplied in the form of natural gas, petroleum, nuclear electric power, and hydroelectric power.

Electricity

Electricity in Santa Clara County in 2020 was consumed primarily by the non-residential sector (73 percent), followed by the residential sector consuming 24 percent. In 2020, a total of approximately 16,435 gigawatt hours (GWh) of electricity was consumed in Santa Clara County.[19]

Silicon Valley Power (SVP) is the City of Santa Clara's energy utility and would provide electricity service to the project site. Starting in January 2018, SVP provides residential customers with carbon-free power as their standard, default power supply. This means the power generation produces no net carbon emissions. For commercial customers, SVP offers several options for participation in green energy programs, including a carbon-free energy option.[20]

Natural Gas

PG&E provides natural gas services within the City of Santa Clara. In 2020, approximately two percent of California's natural gas supply came from in-state production, while the remaining supply was imported from other western states and Canada.[21] In 2020 California used 2,144 trillion Btu of natural gas.[22] In 2020, Santa Clara County used less than one percent of the state's total consumption of natural gas.[23]

[17] United States Energy Information Administration. "State Profile and Energy Estimates, 2020." Accessed July 5, 2022. https://www.eia.gov/state/?sid=CA#tabs-2.
[18] United States Energy Information Administration. "State Profile and Energy Estimates, 2020." Accessed August 8, 2022. https://www.eia.gov/state/?sid=CA#tabs-2.
[19] California Energy Commission. Energy Consumption Data Management System. "Electricity Consumption by County." Accessed August 8, 2022. http://ecdms.energy.ca.gov/elecbycounty.aspx.
[20] Silicon Valley Power. "Did you Know." Accessed August 8, 2022. https://www.siliconvalleypower.com/svp-and-community/about-svp/faqs.
[21] California Gas and Electric Utilities. 2020 *California Gas Report.* Accessed August 8, 2022. https://www.socalgas.com/sites/default/files/2020-10/2020_California_Gas_Report_Joint_Utility_Biennial_Comprehensive_Filing.pdf.
[22] United States Energy Information Administration. "State Profile and Energy Estimates, 2020." Accessed August 8, 2022. https://www.eia.gov/state/?sid=CA#tabs-2.
[23] California Energy Commission. "Natural Gas Consumption by County." Accessed August 8, 2022. http://ecdms.energy.ca.gov/gasbycounty.aspx.

Fuel for Motor Vehicles

In 2019, 15.4 billion gallons of gasoline were sold in California.[24] The average fuel economy for light-duty vehicles (autos, pickups, vans, and sport utility vehicles) in the United States has steadily increased from about 13.1 miles per gallon (mpg) in the mid-1970s to 25.4 mpg in 2020.[25] Federal fuel economy standards have changed substantially since the Energy Independence and Security Act was passed in 2007. That standard, which originally mandated a national fuel economy standard of 35 miles per gallon by the year 2020, was updated in April 2022 to require all cars and light duty trucks achieve an overall industry average fuel economy of 49 mpg by model year 2026. [26,27]

The project site does not currently consume energy resources because it is vacant.

4.6.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
2) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Impact EN-1: The project would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. (Less than Significant Impact)

Construction Impacts

Construction requires efficiency in processes and resource use to optimize construction operations and ensure that the building process isn't wasteful. This means that the energy consumption and use of materials on a construction site would be as minimal as possible and would not be wasteful and inefficient for the duration of the construction process. The project would also be mandated to comply with the City's requirements to recycle or salvage a minimum of 65 percent of nonhazardous

[24] California Department of Tax and Fee Administration. "Net Taxable Gasoline Gallons." Accessed August 8, 2022. https://www.cdtfa.ca.gov/dataportal/dataset.htm?url=VehicleTaxableFuelDist.
[25] United States Environmental Protection Agency. "The 2021 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology since 1975." November 2021. https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1010U68.pdf.
[26] United States Department of Energy. *Energy Independence & Security Act of 2007.* Accessed July 20, 2022. http://www.afdc.energy.gov/laws/eisa.
[27] United States Department of Transportation. USDOT Announces New Vehicle Fuel Economy Standards for Model Year 2024-2026." Accessed July 20, 2022. https://www.nhtsa.gov/press-releases/usdot-announces-new-vehicle-fuel-economy-standards-model-year-2024-2026

construction and demolition waste for reuse, minimizing energy impacts from the creation of production of new construction materials. Therefore, construction of the proposed project would not result in excessive or unnecessary consumption of energy resources.

Operational Impacts

The proposed project would construct a mixed-use residential building which would increase energy consumption on-site. There would be no demand for natural gas on the project site because the development would be required to comply with the City's Reach Code which prohibits natural gas in new residential construction. The proposed project would be built according to California Building Code (CBC) and CALGreen Standards.

Additionally, the proposed project is requesting a General Plan Amendment for the project site which would increase the density of the site beyond build out assumed in the General Plan. This means that the number of residents on-site would exceed the expected energy consumption estimated in the General Plan. The 39 residential units and 1,500 square feet of ground floor retail would use approximately 141,331 MW/year of electricity.[28] The proposed project would convert the project site from Neighborhood Mixed Use to Very High-Density Mixed Use. This would allow for an increase in the number of units allowed on-site from 14 units maximum (at 20-36 units/acre) to the 39 units included in the proposed project (at 50-100 units/acre). This would only result in increased energy consumption from 25 residential units over the existing General Plan designation or 61,791 MW/year. This increase is far less than the Citywide yearly energy consumption of 16,435 GWh per year. Additionally, the proposed project would be compliant with Title 24 energy regulations and would include efficient appliances which would ensure energy use on-site is as efficient as possible. Therefore, the proposed project would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project operations.

Impact EN-2:	**The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. (Less than Significant Impact)**

The project would not result in a substantial energy increase and would implement energy efficiency standards consistent with the CBC and CALGreen. Therefore, the project would comply with state and local plans for renewable energy and energy efficiency.

[28] CalEEMod. Appendix D. October 2017. Accessed July 19, 2022.
39 units x 282.15kWhr/du = 11003.85 kWhrs x 8760 hrs/year = 96,393 MW/year
1500 square feet x 3.42 kWhr/sqft = 5,130 kWhrs x 8760 hrs/year = 44,938 MW/year

4.7 GEOLOGY AND SOILS

The information in this section is based in part on the Geotechnical Design Report prepared by Tetra Tech on May 26, 2022. This study is included as Appendix B as part of this document.

4.7.1 Environmental Setting

4.7.1.1 *Regulatory Framework*

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed following the 1971 San Fernando earthquake. The act regulates development in California near known active faults due to hazards associated with surface fault ruptures. Alquist-Priolo maps are distributed to affected cities, counties, and state agencies for their use in planning and controlling new construction. Areas within an Alquist-Priolo Earthquake Fault Zone require special studies to evaluate the potential for surface rupture to ensure that no structures intended for human occupancy are constructed across an active fault.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (SHMA) was passed in 1990 following the 1989 Loma Prieta earthquake. The SHMA directs the California Geological Survey (CGS) to identify and map areas prone to liquefaction, earthquake-induced landslides, and amplified ground shaking. CGS has completed seismic hazard mapping for the portions of California most susceptible to liquefaction, landslides, and ground shaking, including the central San Francisco Bay Area. The SHMA requires that agencies only approve projects in seismic hazard zones following site-specific geotechnical investigations to determine if the seismic hazard is present and identify measures to reduce earthquake-related hazards.

California Building Standards Code

The CBC prescribes standards for constructing safe buildings. The CBC contains provisions for earthquake safety based on factors including occupancy type, soil and rock profile, ground strength, and distance to seismic sources. The CBC requires that a site-specific geotechnical investigation report be prepared for most development projects to evaluate seismic and geologic conditions such as surface fault ruptures, ground shaking, liquefaction, differential settlement, lateral spreading, expansive soils, and slope stability. The CBC is updated every three years.

California Division of Occupational Safety and Health Regulations

Excavation, shoring, and trenching activities during construction are subject to occupational safety standards for stabilization by the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) under Title 8 of the California Code of Regulations and Excavation Rules. These regulations minimize the potential for instability and collapse that could injure construction workers on the site.

Public Resources Code Section 5097.5

Paleontological resources are the fossilized remains of organisms from prehistoric environments found in geologic strata. They range from mammoth and dinosaur bones to impressions of ancient animals and plants, trace remains, and microfossils. These materials are valued for the information they yield about the history of the earth and its past ecological settings. California Public Resources Code Section 5097.5 specifies that unauthorized removal of a paleontological resource is a misdemeanor. Under the CEQA Guidelines, a project would have a significant impact on paleontological resources if it would disturb or destroy a unique paleontological resource or site or unique geologic feature.

Local

Santa Clara General Plan

General Plan geology and soils-related policies applicable to the project include the following.

Policies	Description
5.10.5-P5	Regulate development, including remodeling or structural rehabilitation, to ensure adequate mitigation of safety hazards, including flooding, seismic, erosion, liquefaction and subsidence dangers.
5.10.5-P6	Require that new development is designed to meet current safety standards and implement appropriate building codes to reduce risks associated with geologic conditions.
5.10.5-P7	Implement all recommendations and design solutions identified in project soils reports to reduce potential adverse effects associated with unstable soils or seismic hazards.

4.7.1.2 *Existing Conditions*

The City of Santa Clara is located in the Santa Clara Valley, a relatively flat alluvial basin, bounded by the Santa Cruz Mountains to the southwest and west, the Diablo Mountain Range to the east, and San Francisco Bay to the north. The topography of the Santa Clara Valley rises from sea level at the south end of San Francisco Bay to elevations of more than 2,000 feet to the east. The average grade of the valley floor ranges from nearly horizontal to about two percent generally down to the northwest. Grades are steeper on the surrounding hillsides.

The project site is underlain by Urbanland-Hangerone complex, 0 to 2 percent slopes, drained which consists of some fill soils along with native soil structures. These soils are poorly drained and upper layers consist primarily of clay and have high potential for shrink swell action.[29] The geotechnical report also determined that the specific soils on-site have the potential for expansion.

The Northern California region is known to be seismically active. Earthquakes occurring within approximately 60 miles of the project site are generally capable of generating ground shaking of a strength which would affect structures. The closest active faults to the site include the Monte Vista-Shannon fault located approximately 6.6 miles southwest of the site, the Hayward-Rodgers Creek fault located approximately 8.9 miles north of the site, and the Calaveras fault approximately 9.8

[29] United States Department of Agriculture. Web Soil Survey. Accessed July 20, 2022.

miles to the northeast. The North San Andreas fault is the most significant fault in the area in terms of highest possible earthquake magnitude and is located approximately 10.6 miles southwest of the site.

The project site is level and is not at risk of landslides or other land subsidence. The City does not contain any faults zoned under the Alquist-Priolo Earthquake Fault Zoning Act.[30] The risk of surface fault rupture in the City is considered low. Additionally, according to the Santa Clara General Plan, the project site is located in a region characterized by a moderate to high ground shaking hazard and, due to the location of the site within a liquefaction zone, however, based on liquefaction testing conducted as a part of the geotechnical investigation, the site would only experience a small amount of seismic related ground failure resulting from liquefaction or other settlement.[31]

Groundwater depth on the project site was determined to be four feet below the ground surface (bgs) based on the geotechnical report for the project site, which based the depth of water off well borings, historic groundwater levels, and department of conservation mapping efforts.[32]

4.7.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
– Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42)?	☐	☐	☒	☐
– Strong seismic ground shaking?	☐	☐	☒	☐
– Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐
– Landslides?	☐	☐	☐	☒
2) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐

[30] City of Santa Clara. 2010-2035 General Plan Integrate EIR. Page 183. January 2011.
[31] City of Santa Clara. 2010-2035 General Plan Integrate EIR. Page 184-186. January 2011.
Tetra tech. Geotechnical Design Report. May 26, 2022.
[32] Tetra tech. Geotechnical Design Report. May 26, 2022.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
4) Be located on expansive soil, as defined in the current California Building Code, creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
5) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
6) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☒	☐	☐

Impact GEO-1: As mitigated, the project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; strong seismic ground shaking; seismic-related ground failure, including liquefaction; or landslides. (Less than Significant Impact with Mitigation Incorporated)

The proposed project is not located within an Alquist-Priolo Earthquake Fault Zoning Map area where fault rupture may occur. Therefore, the proposed project would not cause risk of loss, injury, or death involving rupture of a known earthquake fault. The project site and surrounding area are also relatively flat; therefore, development on-site would not expose adjacent or nearby properties to landslide related hazards.

The proposed project would be constructed on soils within a mapped liquefaction hazard zone and with shrink swell potential. While no active faults are known to cross the project site, the project would experience intense ground shaking in the event of a large earthquake. Therefore, seismic-related ground failure may occur.

Impact GEO-1.1: Buildings constructed on-site could experience settlement in the event of strong ground shaking as a result of an earthquake or other geologic events.

Mitigation Measures

MM-GEO 1.1-1: To avoid or minimize potential damage from seismic shaking and other geologic events, and consistent with General Plan Policy 5.10.5-P6, the project would be built using standard engineering and seismic safety design techniques. Building design and construction at the site shall be completed in conformance with the recommendations of a design-level geotechnical investigation, which will be included in a geotechnical report to the City. The

report shall be reviewed and approved by the City of Santa Clara's Building Division as part of the building permit review and issuance process. The building shall meet the requirements of applicable Building and Fire Codes, including the 2022 California Building Code, as adopted or updated by the City. The project shall be designed to withstand potential geologic hazards identified on the site, including liquefaction and shrink swell capacity of soils, and the project shall be designed to reduce the risk to life or property to the extent feasible and in compliance with the Building Code.

With implementation of the identified mitigation measure, project impacts would be reduced to a less than significant level.

Impact GEO-2: The project would not result in substantial soil erosion or the loss of topsoil. (Less than Significant Impact)

The proposed project would excavate and grade a site less than one acre in size. Therefore, the proposed project would not be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) under the National Pollutant Discharge Elimination System (NPDES). To prevent erosion and limit the loss of soil from the site, the proposed project would be required to comply with grading and excavation requirements in the Santa Clara City Building Code. In addition, the project would be required to comply with the following standard conditions of approval:

Conditions of Approval

- All excavation and grading work would be scheduled in dry weather months or construction sites would be weatherized[33] to withstand or avoid erosion.
- Stockpiles and excavated soils would be covered during construction with secured tarps or plastic sheeting.
- Vegetation in disturbed areas would be replanted as quickly as possible after construction.

Through the implementation of the identified conditions of approval to reduce construction-related water quality impacts, the proposed project would have a less than significant impact on soil erosion and loss of topsoil.

Impact GEO-3: The project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. (Less than Significant Impact)

As stated in Impact GEO-1.1 the proposed project would be constructed on soils at risk of liquefaction during seismic events. Due to the relatively flat topography and the absence of free face slopes, lateral spreading, landslides, subsidence, or collapse during seismic shaking are not hazards at the site. The proposed project would be constructed in compliance with a site-specific geotechnical report, SCCC, and the CBC requiring the project to analyze and remediate site-specific soil

[33] Weatherized refers to measures that would protect exposed soils from rain and stormwater runoff.

conditions. Therefore, the proposed project would not result in a risk of instability and would have a less than significant impact.

Impact GEO-4:	**The project would not be located on expansive soil, as defined in the current California Building Code, creating substantial direct or indirect risks to life or property. (Less than Significant Impact)**

Based on the analysis provided in the Geotechnical Report, soils in the project site have shrink swell properties which may cause damage to structures. The proposed project would comply with General Plan Policy 5.10.5-P6 and the CBC, which requires preparation of a design level geotechnical study to provide evaluation of the likelihood of damage resulting from expansive soils and identify building design requirements to avoid impacts associated with these soils. Therefore, the proposed project would have a less than significant impact on risks to life or property resulting from expansive soils.

Impact GEO-5:	**The project would not have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. (No Impact)**

The proposed project would be connected to the existing sewage utility system provided by the City of Santa Clara. Therefore, the proposed project would not require the use of septic tanks or alternative wastewater disposal systems and would have no impact.

Impact GEO-6:	**As mitigated, the project would not directly or indirectly destroy a unique paleontological resource or site or unique geological feature. (Less than Significant Impact with Mitigation Incorporated)**

The project site is underlain by geologic units of Holocene age, which are generally not considered sensitive for paleontological resources because biological remains younger than 10,000 years are not usually considered fossils. Thus, these sediments have low potential to yield fossil resources or to contain significant nonrenewable paleontological resources. More recent sediments, however, may overlie older Pleistocene sediments with high potential to contain paleontological resources. These older sediments, often found at depths of greater than 10 feet bgs, have yielded the fossil remains of plants and extinct terrestrial Pleistocene vertebrates. The proposed project would include subsurface structures, which would extend to a depth of 12 feet bgs. Therefore, the project could encounter previously unknown resources on-site and may result in the destruction of these resources resulting in a significant impact.

Impact GEO-6.1: Construction activities could disturb paleontological resources in older Pleistocene sediments at depth under the project site.

Mitigation Measure: The proposed project would implement the following mitigation measure to reduce impacts on these resources.

MM-GEO 6.1-1: If vertebrate fossils are discovered during construction, all work on the site shall stop immediately, the Director of Community Development or the Director's designee shall be notified, and a qualified professional paleontologist shall assess the nature and importance of the find and recommend appropriate treatment. Treatment may include, but is not limited to, preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection and may also include preparation of a report for publication describing the finds. The project applicant shall be responsible for implementing the recommendations of the qualified paleontologist. A report of all findings shall be submitted to the Director of Community Development or the Director's designee.

Through compliance with the above Mitigation Measure, the proposed project would avoid impacting of paleontological resources or unique geological features. Therefore, the proposed project would have a less than significant impact through directly or indirectly destroying a unique paleontological resource or site or unique geological feature.

4.8 GREENHOUSE GAS EMISSIONS

4.8.1 Environmental Setting

4.8.1.1 *Background Information*

Gases that trap heat in the atmosphere, GHGs, regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. In GHG emission inventories, the weight of each gas is multiplied by its global warming potential (GWP) and is measured in units of CO_2 equivalents (CO_2e). 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 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 SF_6 emissions are commonly created by industries such as aluminum production and semiconductor manufacturing.

An expanding body of scientific research supports the theory that global climate change is currently causing 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.

4.8.1.2 *Regulatory Framework*

State

Assembly Bill 32

Under the California Global Warming Solutions Act, also known as AB 32, CARB established a statewide GHG emissions cap for 2020, adopted mandatory reporting rules for significant sources of GHGs, and adopted a comprehensive plan, known as the Climate Change Scoping Plan, identifying how emission reductions would be achieved from significant GHG sources.

In 2016, SB 32 was signed into law, amending the California Global Warming Solution Act. SB 32, and accompanying Executive Order B-30-15, require CARB to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030. CARB updated its Climate Change Scoping Plan in December of 2017 to express the 2030 statewide target in terms of million metric tons of CO_2E ($MMTCO_2e$). Based on the emissions reductions directed by SB 32, the annual 2030 statewide target emissions level for California is 260 $MMTCO_2e$.

Senate Bill 375

SB 375, known as the Sustainable Communities Strategy and Climate Protection Act, was signed into law in September 2008. SB 375 builds upon AB 32 by requiring CARB to develop regional GHG reduction targets for automobile and light truck sectors for 2020 and 2035. The per capita GHG emissions reduction targets for passenger vehicles in the San Francisco Bay Area include a seven percent reduction by 2020 and a 15 percent reduction by 2035.

Consistent with the requirements of SB 375, the Metropolitan Transportation Commission (MTC) partnered with the Association of Bay Area Governments (ABAG), BAAQMD, and the Bay Conservation and Development Commission to prepare the region's Sustainable Communities Strategy (SCS) as part of the Regional Transportation Plan process. The SCS is referred to as Plan Bay Area 2050. Plan Bay Area 2050 establishes a course for reducing per capita GHG emissions through the promotion of compact, high-density, mixed-use neighborhoods near transit, particularly within identified Priority Development Areas (PDAs).

Regional and Local

2017 Clean Air Plan

To protect the climate, the 2017 CAP (prepared by BAAQMD) includes control measures designed to reduce emissions of methane and other super-GHGs that are potent climate pollutants in the near-term, and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

CEQA Air Quality Guidelines

The BAAQMD CEQA Air Quality Guidelines are intended to serve as a guide for those who prepare or evaluate air quality impact analyses for projects and plans in the San Francisco Bay Area. The jurisdictions in the San Francisco Bay Area Air Basin utilize the thresholds and methodology for assessing GHG impacts developed by BAAQMD within the CEQA Air Quality Guidelines. The guidelines include information on legal requirements, BAAQMD rules, methods of analyzing impacts, and recommended mitigation measures.

Santa Clara General Plan

General Plan policies related to GHG emissions from the project include the following.

Policies	Description
5.3.1-P10	Provide opportunities for increased landscaping and trees in the community, including requirements for new development to provide street trees and a minimum 2:1 on- or off-

	site replacement for trees removed as part of the proposal to help increase the urban forest and minimize the heat island effect.
5.8.5-P1	Require new development and City employees to implement transportation demand management programs that can include site-design measures, including preferred carpool and vanpool parking, enhanced pedestrian access, bicycle storage and recreational facilities.
5.8.5-P5	Encourage transportation demand management programs that provide incentives for the use of alternative travel modes to reduce the use of single-occupant vehicles.

City of Santa Clara Climate Action Plan

The City of Santa Clara Climate Action Plan 2022 (2022 CAP) is the latest update to the City's CAP and is designed to meet the statewide GHG reduction targets for 2030 set by Senate Bill 32. As a Qualified Climate Action Plan, the 2022 CAP allows for tiering and streamlining of GHG analyses under CEQA. The 2022 CAP identifies existing City policies and regulations as well as new measures to be implemented by development projects in the areas of building/energy use, transportation/land use, materials/ consumption, natural resources & water resources, and community resilience & wellbeing. Projects that comply with the policies and strategies outlined in the 2022 CAP would have a less than significant GHG impact.

Silicon Valley Power

Silicon Valley Power (SVP) is the City of Santa Clara's energy utility and would provide electricity service to the project site. Starting in January 2018, SVP provides residential customers with carbon-free power as their standard, default power supply. This means the power generation produces no net carbon emissions. For commercial customers, SVP offers several options for participation in green energy programs, including a carbon-free energy option.[34]

4.8.1.3 *Existing Conditions*

Unlike emissions of criteria and toxic air pollutants, which have regional and local impacts, emissions of GHGs have a broader, global impact. Global warming is a process whereby GHGs accumulating in the upper atmosphere contribute to an increase in the temperature of the earth and changes in weather patterns.

The site is currently undeveloped and does not contribute to GHG emissions.

[34] Silicon Valley Power. "Green Power for your Home." Accessed July 11, 2022. https://www.siliconvalleypower.com/sustainability/santa-clara-green-power/green-power-for-your-home.

4.8.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?	☐	☐	☒	☐

Impact GHG-1: The project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. **(Less than Significant Impact)**

Construction Emissions

GHG emissions associated with construction were computed to be 258 MT of CO_2e for the total construction period.[35] These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the City nor BAAQMD have an adopted threshold of significance for construction-related GHG emissions, though BAAQMD recommends quantifying emissions and disclosing that GHG emissions would occur during construction. Construction of the project would be temporary and would not result in a permanent increase in emissions. Therefore, the project would not interfere with the implementation of SB 32 or AB 32.

Operational Emissions

The BAAQMD thresholds for GHG Emissions established on April 20, 2022 include the following project design elements for Land Use projects:

- The project will not include natural gas appliances or natural gas plumbing.
- The project will not result in wasteful, inefficient, or unnecessary energy usage.
- Achieve a reduction in project-generated VMT below the regional average consistent with the California Climate Change Scoping Plan 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 in CEQA.
- Achieve compliance with off-street electrical vehicle requirements in the most recently adopted version of CALGreen Tier 2.

The proposed project would comply with the Santa Clara Reach Code and would not include natural gas appliances and would include energy efficient appliances. The proposed project would include standard electronics and appliances associated with the residential and commercial uses on-site,

[35] Illingworth and Rodkin. 2655 The Alameda Residential Development Construction Community Risk Assessment. September 21, 2022.

consistent with the requirements of the Reach Code, CBC, and CALGreen, and would not result in wasteful, inefficient, or unnecessary energy usage. The proposed project would be considered an infill project with proximity to transit and would be consistent with the Senate Bill 743 VMT targets for new development. Finally, the proposed project would be consistent with CALGreen for off-street electrical vehicle requirements. Therefore, the proposed project would not result in GHG emissions associated with operations of the project.

Impact GHG-2:	**The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. (Less than Significant Impact)**

The proposed project would be required to comply with the City of Santa Clara 2022 CAP. The proposed project would be required to be constructed with full electrification to be compatible with the City's Reach Code. Additionally, the proposed project is within 0.5 miles of transit with 15-minute headways, and regional transportation connections. The proposed project would have low VMT (see Section 4.17) and would be accessible by bicycle facilities situated near the project site. The project includes water sustainable landscaping and would plant trees along the public right of way for additional shading on sidewalks around the project site. The proposed project would also comply with salvaging requirements during construction. All of these features would allow the project to reduce GHG emissions in compliance with the 2022 CAP and would contribute to overall GHG reductions for the life of the project.

The proposed project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB's Scoping Plan nor would the project conflict with SB 375 goals. Specifically, the proposed buildings 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 efficiency standards. Therefore, the proposed project would result in a less than significant impact.

4.9 HAZARDS AND HAZARDOUS MATERIALS

The information in this Section is based in part on the Phase 1 Environmental Site Assessment (ESA) prepared by Tetra Tech on May 22, 2022. This study is included in Appendix C of this document. Additionally, information in the section is based on the Draft Soil and Groundwater Management Plan prepared by Tetra Tech on March 31, 2023 and included as Appendix D.

4.9.1 Environmental Setting

4.9.1.1 *Regulatory Framework*

Overview

The storage, use, generation, transport, and disposal of hazardous materials and waste are highly regulated under federal and state laws. In California, the EPA has granted most enforcement authority over federal hazardous materials regulations to the California Environmental Protection Agency (CalEPA). In turn, local agencies have been granted responsibility for implementation and enforcement of many hazardous materials regulations under the Certified Unified Program Agency (CUPA) program.

Worker health and safety and public safety are key issues when dealing with hazardous materials. Proper handling and disposal of hazardous material is vital if it is disturbed during project construction. Cal/OSHA enforces state worker health and safety regulations related to construction activities. Regulations include exposure limits, requirements for protective clothing, and training requirements to prevent exposure to hazardous materials. Cal/OSHA also enforces occupational health and safety regulations specific to lead and asbestos investigations and abatement.

Federal and State

Federal Aviation Regulations Part 77

Federal Aviation Regulations, Part 77 Objects Affecting Navigable Airspace (FAR Part 77) sets forth standards and review requirements for protecting the airspace for safe aircraft operation, particularly by restricting the height of potential structures and minimizing other potential hazards (such as reflective surfaces, flashing lights, and electronic interference) to aircraft in flight. These regulations require that the Federal Aviation Administration (FAA) be notified of certain proposed construction projects located within an extended zone defined by an imaginary slope radiating outward for several miles from an airport's runways, or which would otherwise stand at least 200 feet in height above the ground.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, $1.6 billion was collected and the tax went to a trust fund for cleaning

up abandoned or uncontrolled hazardous waste sites. CERCLA accomplished the following objectives:

- Established prohibitions and requirements concerning closed and abandoned hazardous waste sites;
- Provided for liability of persons responsible for releases of hazardous waste at these sites; and
- Established a trust fund to provide for cleanup when no responsible party could be identified.

The law authorizes two kinds of response actions:

- Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response; and
- Long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life-threatening. These actions can be completed only at sites listed on the EPA's National Priorities List.

CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the National Priorities List. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986.[36]

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA), enacted in 1976, is the principal federal law in the United States governing the disposal of solid waste and hazardous waste. RCRA gives the EPA the authority to control hazardous waste from the "cradle to the grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also sets forth a framework for the management of non-hazardous solid wastes.

The Federal Hazardous and Solid Waste Amendments (HSWA) are the 1984 amendments to RCRA that focused on waste minimization, phasing out land disposal of hazardous waste, and corrective action for releases. Some of the other mandates of this law include increased enforcement authority for the EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program.[37]

Government Code Section 65962.5

[36] United States Environmental Protection Agency. "Superfund: CERCLA Overview." Accessed July 11, 2022. https://www.epa.gov/superfund/superfund-cercla-overview.
[37] United States Environmental Protection Agency. "Summary of the Resource Conservation and Recovery Act." Accessed July 11, 2022. https://www.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act.

Section 65962.5 of the Government Code requires CalEPA to develop and update a list of hazardous waste and substances sites, known as the Cortese List. The Cortese List is used by state and local agencies and developers to comply with CEQA requirements. The Cortese List includes hazardous substance release sites identified by the Department of Toxic Substances Control (DTSC) and State Water Resources Control Board (SWRCB).[38]

Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) of 1976 provides the EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics, and pesticides. The TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon, and lead-based paint.

California Accidental Release Prevention Program

The California Accidental Release Prevention (CalARP) Program aims to prevent accidental releases of regulated hazardous materials that represent a potential hazard beyond the boundaries of a property. Facilities that are required to participate in the CalARP Program use or store specified quantities of toxic and flammable substances (hazardous materials) that can have off-site consequences if accidentally released. The Santa Clara Fire Department of reviews CalARP risk management plans as the CUPA.

Asbestos-Containing Materials

Friable asbestos is any asbestos-containing material (ACM) that, when dry, can easily be crumbled or pulverized to a powder by hand, allowing the asbestos particles to become airborne. Common examples of products that have been found to contain friable asbestos include acoustical ceilings, plaster, wallboard, and thermal insulation for water heaters and pipes. Common examples of non-friable ACMs are asphalt roofing shingles, vinyl floor tiles, and transite siding made with cement. The EPA phased out use of friable asbestos products between 1973 and 1978. National Emission Standards for Hazardous Air Pollutants (NESHAP) guidelines require that potentially friable ACMs be removed prior to building demolition or remodeling that may disturb the ACMs.

CCR Title 8, Section 1532.1

The United States Consumer Product Safety Commission banned the use of lead-based paint in 1978. Removal of older structures with lead-based paint is subject to requirements outlined by the Cal/OSHA Lead in Construction Standard, CCR Title 8, Section 1532.1 during demolition activities. Requirements include employee training, employee air monitoring, and dust control. If lead-based paint is peeling, flaking, or blistered, it is required to be removed prior to demolition.

[38] California Environmental Protection Agency. "Cortese List Data Resources." Accessed July 11, 2022. https://calepa.ca.gov/sitecleanup/corteselist/.

Regional and Local

Norman Y. Mineta San José International Airport Comprehensive Land Use Plan

The Norman Y. Mineta International Airport is located approximately 0.8 miles northeast of the project site. Given this distance, the project site is located within the Airport Influence Area (AIA) of the Norman Y. Mineta International Airport, as defined by the Comprehensive Land Use Plan (CLUP). The project would be reviewed by Airport Land Use Commission (ALUC) prior to approval by the lead agency to determine conformance with the CLUP.

Municipal Regional Permit Provision C.12.f

Polychlorinated biphenyls (PCBs) were produced in the United States between 1955 and 1978 and used in hundreds of industrial and commercial applications, including building and structure materials such as plasticizers, paints, sealants, caulk, and wood floor finishes. In 1979, the EPA banned the production and use of PCBs due to their potential harmful health effects and persistence in the environment. PCBs can still be released to the environment today during demolition of buildings that contain legacy caulks, sealants, or other PCB-containing materials.

With the adoption of the San Francisco Bay Region Municipal Regional NPDES Permit (MRP) by the San Francisco Bay Regional Water Quality Control Board (RWQB) on November 19, 2015, Provision C.12.f requires that permittees develop an assessment methodology for applicable structures planned for demolition to ensure PCBs do not enter municipal storm drain systems.[39] Municipalities throughout the Bay Area are currently modifying demolition permit processes and implementing PCB screening protocols to comply with Provision C.12.f. Buildings constructed between 1950 and 1980 that are proposed for demolition must be screened for the presence of PCBs prior to the issuance of a demolition permit. Single family homes and wood-frame structures are exempt from these requirements.

Santa Clara General Plan

General Plan policies hazardous materials-related policies applicable to the project include the following.

Policies	Description
5.10.5-P23	Require appropriate clean-up and remediation of contaminated sites.
5.10.5-P24	Protect City residents from the risks inherent in the transport, distribution, use and storage of hazardous materials.
5.10.5-P25	Use Best Management Practices to control the transport of hazardous substances and to identify appropriate haul routes to minimize community exposure to potential hazards.

Santa Clara Emergency Operations Plan

In June 2016, the City of Santa Clara adopted an Emergency Operations Plan (EOP) to address the planned response to emergency situations associated with natural disasters and technological

[39] California Regional Water Quality Control Board. *San Francisco Bay Region Municipal Regional Stormwater NPDES Permit.* November 2015.

incidents, as well as chemical, biological, radiological, nuclear and explosive emergencies. The EOP establishes the emergency organization, assign tasks, specifies policies and general procedures, and provides for coordination of planning efforts for emergency events such as earthquake, flooding, dam failure, and hazardous materials responses.

4.9.1.2 *Existing Conditions*

Current Uses of the Project Site

The project site is currently a vacant dirt lot, with no improvements, which is fenced on all sides with an entrance gate located on Park Avenue and The Alameda. The site is located in a mixed-use commercial/residential area of the City of Santa Clara. The project site was previously used as a gas station and is an active leaking underground storage tank (LUST) site which is undergoing remediation with oversight by the RWQCB. The underground storage tanks (USTs) and all associated features have been removed and soil vapor extraction and groundwater monitoring wells are currently operating on the site. Twenty-four monitoring wells are located within the fenced area of the site.

Existing Uses of Surrounding Properties

The project site is surrounded on three sides by roadways with a large parking lot to the south that serves the Safeway shopping center. The surrounding properties are a mixture of commercial and residential uses. Santa Clara University student housing and associated quasi-public buildings are located across The Alameda, north and east of the project site. A mixture of commercial and residential properties are adjacent to the southwest and west of the project site including a drycleaners (University Cleaners) in the shopping center southeast of the project site. The adjacent property northwest of the property across Park Avenue is a daycare (Kids on Campus).

Historic Use of Project Site

As stated above, the site formerly contained a gas station. All structures on-site have been removed and the project site is currently vacant and unimproved. The perimeter of the project site is fenced with gates on the east and west sides.

No areas of recent soil disturbance were observed during the site reconnaissance. At the time of the site reconnaissance, grasses and weeds covered most all of the project site with small patches of asphalt visible beneath the soil in the southeast portion of the project site.

Twenty-four monitoring wells were observed on-site during the site reconnaissance. An additional six monitoring wells were observed off-site, primarily to the west and north. Several of the monitoring wells were opened to check condition, and one on-site well (UV-4) was found to have been filled. A petroleum odor was observed from wells U-12, U-14 and U-18 when opened. No other noticeable odors were detected during the site reconnaissance.

Other than the release which required installation of the monitoring wells (as detailed below), no other evidence of spills or releases were observed during the site reconnaissance.

Existing On-Site Hazards

As noted above, the project site is an active LUST cleanup site under the RWQCB. A former UNOCAL branded service station operated on the project site from approximately 1930 to 1993. Site features included a station building, three gas pump islands, four USTs, one waste oil UST, and a clarifier. In March 1993, the service station ceased operations and all above- and below-ground facilities were removed. Site assessments performed at the project site since 1988 revealed petroleum hydrocarbon impacts to soil, soil vapor, and groundwater.

A network of groundwater monitoring wells is installed at and to the north of the project site has been gauged and sampled generally on a quarterly basis since 1991. The groundwater flow direction beneath the project site is predominantly to the north-northwest with a high variability in groundwater elevations since groundwater monitoring began. A variety of bioremediation techniques have been utilized for the site as outlined on page 7-1 and7-2 of Appendix C.

A request for closure was made in May 2020 under the Low-Threat Underground Storage Tank Case Closure Policy; however, the RWQCB has not granted closure for the project site. The results of the latest groundwater monitoring event conducted in March 2022 indicates significant petroleum impacts remain on the project site and have migrated off-site to the northwest. The presence of petroleum products at the project site due to a release and the lack of regulatory closure is considered a recognized environmental condition (REC).

Existing Off-Site Hazards

Twenty-six sites located within a half-mile of the project site were listed on the EnviroStor database as sites with hazardous materials or past releases. These sites are further described in the Phase 1 ESA prepared for the project. Based on the findings in the report these sites would not represent RECs for the project site due to distance from the site and direction of groundwater flow.

Five other LUST sites were identified in the Phase 1 further from the project site on different regulatory databases, however, based on the location, extent of contamination, and flow of groundwater these sites were not determined to be RECs for the project site.

700 Bellomy Street

A former gasoline service station located at 700 Bellomy Street (currently the Pizza My Heart restaurant) is immediately west of the project site across Park Avenue. A 2,500-gallon and a 750-gallon UST containing diesel/gasoline were discovered during excavation activities within the sidewalk of Park Avenue in 1994. Elevated concentrations of petroleum hydrocarbons were detected in soil samples collected from beneath the USTs and in groundwater. Three groundwater monitoring wells were installed at the northern portion of the property and within Park Avenue. The last groundwater monitoring event at this property was conducted in April 2002. Gasoline and benzene were detected on-site at this time in moderate levels. The facility received a case closure letter from Valley Water on June 26, 2002 with the advisory that moderate levels of residual soil contamination exist in the vicinity of the former tank system beneath the sidewalk along Park Avenue. The release from the UST is considered a historical recognized environmental condition (HREC) as the petroleum impacts associated with the release from the property may have affected the project site;

however, the impacts have been addressed to the satisfaction of the regulatory authority (Valley Water).

4.9.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
2) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
3) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
4) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☒	☐	☐
5) For a project located within 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, result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☒	☐
6) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
7) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☒

Impact HAZ-1: The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (Less than Significant Impact)

Construction

The proposed project would not require large amounts of hazardous materials to be brought to and from the project site during construction. Therefore, the proposed project would not result in impacts during construction related to the routine transport, use, or disposal of hazardous materials.

Operations

The proposed project would likely include the use and storage of cleaning supplies and maintenance chemicals in small quantities typical for residential land uses. The small quantities of cleaning supplies and maintenance chemicals used on-site during project operation would not pose a risk to adjacent land uses. Based on the proposed use of the site, the project would not create a significant hazard to the public or environment from the use, transport, or storage of these chemicals.

Impact HAZ-2:	**As mitigated, the project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (Less than Significant Impact with Mitigation Incorporated)**

The proposed project would be constructed on a vacant site, therefore, no lead or asbestos impacts would occur as a result of demolition of structures on-site.

Based on the Phase 1 ESA prepared for the proposed project, contamination resulting from the LUST on-site (Park Avenue Site), which was removed from the project site, and contamination resulting from the adjacent closed LUST site at 700 Bellomy have resulted in soil and groundwater contamination on the project site. These sites are associated with prior uses of petroleum projects and detectable amounts of Benzene, Hexane, Ethlybenzene, Chlroroform, Tetrachloroethene (PCE), n-Heptane, and 1,2-Dibromoethane have been found at testing wells located throughout the project site in excess of residential screening thresholds. These petroleum byproducts present in soil and groundwater could result in exposure of construction workers and persons in proximity to contaminated soil, groundwater, and soil vapor.

These two conditions would represent an environmental hazard for construction workers. Based on the March 2022 testing of the groundwater, petroleum products are still present in the project site and construction activities that would expose the contaminants would result in a significant impact.

IMPACT HAZ-2.1 Construction activities associated with the proposed project could expose the public and/or the environment to hazardous materials and/or soil, soil vapor, and/or groundwater contamination from the former use of the site and from contaminants that have migrated from off-site.

Mitigation Measure

MM HAZ-2.1: Prior to obtaining grading permits, the environmental professional will perform chemical injections to remediate groundwater impacts present at the site and will collect soil vapor samples across the property prior to preparation of the Health and Safety Plan (HSP) and construction activities to evaluate the soil vapor concentrations present and the potential for vapor intrusion to occur. The groundwater injections will be performed in accordance with the Remedial Action Plan for Groundwater for the proposed project and persulfate injection will be used to oxidize the contaminants of

concern with limited byproducts from the process. Groundwater monitoring will be conducted in compliance with a waste discharge requirement (WDR) permit after the injections are conducted to meter the performance of the procedure under the oversight of the Regional Water Quality Control Board (RWQCB). The results of the performance groundwater monitoring events will be provided in the semi-annual groundwater monitoring reports and WDR reports as required by the WDR permit. The soil vapor samples will be collected in accordance with the identified in the Soil Vapor Assessment Work Plan prepared for the proposed project.

MM HAZ-2.2: The project applicant shall be required to develop a Soil and Groundwater Management Plan and submit it to the City of Santa Clara and the Santa Clara County Department of Environment Health (SCCDEH) prior to issuance of any demolition or grading permits (whichever occurs first) for review and approval. The project applicant must then provide the approved Soil and Groundwater Management Plan to the general contractor and each of its subcontractors for incorporation into their Health and Safety Plans (HSP).

MM HAZ-2.3: All contractors must prepare a site-specific HSP to establish health and safety protocols for their personnel working at the project site. The HSPs will be reviewed and approved by the City of Santa Clara and the SCCDEH prior to issuance of demolition or grading permits (whichever occurs first) and will be modified accordingly if previously unknown impacted materials are encountered during construction. These modifications must meet Federal and State of California (OSHA) standards for hazardous waste operations (29 CFR 1910.120 and 8 CCR 5192). Earthwork activities in contaminated materials will be performed by licensed contractors with personnel trained in hazardous waste operations (40-hour OSHA training).

All contractors will be responsible for following the protocols presented in their HSP. The contractor will also prepare an injury and illness prevention plan. The contractor's HSP will contain provisions for limiting chemical exposure to construction workers, chemical and on-chemical hazards, emergency procedures, and standard safety protocols.

- Work activities will be conducted with, at a minimum, Level D protection including:
    - Rubber boots when in contact with groundwater;
    - Nitrile gloves when handling impacted soils;
    - Work boots;
    - High-visibility vest or clothing;
    - Safety glasses;
    - Hard hat; and
    - Hearing protection (if noise levels exceed 85 dBA).

Contractors are also required to determine the requirements for worker training, based on the level of expected contact to soil and groundwater associated with their workers' activities.

MM HAZ-2.4: The project site will be fenced and gated with a lock. Access to the project site will be limited by the general contractor to authorized personnel. Site control procedures will be implemented by the general contractor to control the flow of personnel, vehicles, and materials in and out of the site. Signs will be posted by the general contractor instructing visitors to sign in at the project support areas at all project site entrances.

MM HAZ-2.5: If suspect and/or confirmed impacted soil is encountered, decontamination procedures shall be established and implemented by the contractor to reduce the potential for construction equipment and vehicles to release contaminated soil onto public roadways or other off-site transfer. At a minimum, gravel will be placed at all project site access points by the contractor and excess soil will be removed from construction equipment using dry methods (e.g., brushing or scraping) prior to moving the equipment to off-site locations. All truck tires shall be cleaned prior to leaving the project site.

Decontamination rinse will be captured and stored in Department of Transportation (DOT) approved containers for subsequent testing and off-site disposal.

MM HAZ-2.6: Excavated soil suspected to be impacted will be screened in the field by the environmental professional using field observations and an organic vapor meter. Soils observed to be potentially impacted may be direct-loaded into trucks for transport to an appropriate waste management facility under manifest or may be separately stockpiled from presumed "clean" soil for additional testing. Trucks will be loaded so there is at least one foot of free board space and the beds will be covered with a tarp to prevent soil and/or dust from spilling out of the truck during transport to the disposal facility. Prior to leaving the loading area, each truck will be inspected by on-site personnel to ensure that the loads are adequately secured and covered. The stockpile area will be clean and free of debris prior to the placement of the bottom liner. The liners will consist of heavy-duty plastic (minimum of 30-mil) as the bottom and top liners. All stockpiles will include berms for containment of any water that drains from the soil. Stockpiles will be inspected at least twice daily and repaired as needed. At the end of each shift or when the stockpile is not in use for two hours or longer, the pile(s) will be securely covered with the heavy-duty plastic liner. All stockpiles will be handled as to prevent or reduce potential dust generation. Additional water spray will be utilized for dust suppression and foam or surfactant will be utilized for stabilization of stockpiles, if necessary. The environmental professional will collect and process stockpile samples as described in the Soil and Groundwater Management Plan.

MM HAZ-2.7: During construction activities, if unanticipated contamination (e.g., if soil discoloration, odors, and/or elevated organic vapor meter readings are noted), buried structures (e.g., sumps or tanks), or hazardous debris are encountered that may pose a risk to human health or the environment, earthwork in the suspect area will be immediately stopped and worker access to the suspect area will be restricted. The area will be cordoned off using delineators and caution tape, or similar materials by the contractor. Subsequently, the environmental professional and project applicant will be notified. The quality of soil suspected to be contaminated will be evaluated through field screening and/or analytical testing by the environmental professional so that appropriate handling and disposal alternatives can be determined.

MM HAZ-2.8: The environmental professional will be present on-site during the removal of impacted soil and will be responsible for observing soil conditions and contractor's activities. As part of this process, daily field reports documenting site activities will be completed and made available for inspection by authorized oversight personnel for the duration of the project.

The environmental professional will complete daily field reports for each day that they are on-site. Entries will be complete and accurate enough to permit reconstruction of the environmental professional's field activities. Each page will be dated, and the time of entry noted. The following information will be included for each soil sample:

- Sample identification number
- Sample location and description
- Site sketch showing sample location and measured distances
- Sampler's name(s)
- Date and time of sample collection
- Designation of sample as composite or grab
- Type of sample (i.e., matrix)
- Type of preservation
- Type of sampling equipment used
- Field observations and details important to analysis or integrity of samples (e.g., heavy rains, odors, colors, etc.)
- Instrument readings (e.g., photoionization detector [PID], etc.)
- Chain-of-custody form numbers and chain-of-custody seal numbers
- Transport arrangements (courier delivery, lab pickup, etc.).

MM HAZ-2.9: The following general procedures will be carried out for construction on the project site:

- Trenches/excavations shall be screened daily with an organic vapor meter or similar meter. Total volatile organic compounds at a sustainable concentration of five ppm above background shall require personnel to stop work and leave area. If concentrations do not recede, the trench/excavation shall be barricaded and the Environmental Consultant contacted.
- Open trenches/excavations shall be inspected daily for readily observable indications of possible cave-ins, hazardous atmosphere or other hazardous conditions.
- If readily observable conditions are noted that could result in cave-in, hazardous atmosphere or other hazardous condition, exposed workers shall be removed from the area until the necessary precautions have been taken to address the concern.
- Trenches/excavations shall be protected with adequate barriers or physical protection.
- Stockpiles of soil shall not be stored within two feet of a trench/excavation.
- Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, the atmosphere shall be tested before workers enter the work area.
- Adequate precautions shall be taken to prevent exposures to atmospheres containing less than 19.5 percent oxygen and or hazardous atmospheres, including proper respiratory protection or ventilation.
- Workers shall not work in excavations/trenches in which there is accumulated water or in trenches/excavations in which water is accumulating, unless adequate precautions have been taken against the hazards posed by the accumulation. These measures can include PPE, shoring or water removal.
- Workers shall wash hands thoroughly after handling project site soil or groundwater even if they were wearing protective gloves.

MM HAZ-2.10: If utility trenches extend into groundwater, measures will be implemented to reduce the potential for vapor and groundwater migration through trench backfill and utility conduits. Such measures shall include placement of low-permeability backfill "plugs" at selected intervals on-site and at all locations where the utility trenches extend off-site. In addition, utility conduits that are placed below groundwater will be installed with water-tight fittings to reduce the potential for groundwater to migrate into the conduits. A qualified civil engineer will survey and record all 'plug' placement locations.

MM HAZ-2.11: If excavation dewatering is required, pumped water will be transferred from the excavations into holding tanks and then either pumped to the sanitary sewer under a publicly owned treatment works permit, treated and discharged

to the storm drain system pursuant to a California Regional Water Quality Control Board – San Francisco Bay Region (Water Board) National Pollutant Discharge Elimination System (NPDES) permit, and/or loaded into tanker trucks for off-site disposal at an appropriately licensed facility.

With implementation of the identified mitigation measures, redevelopment of the project site would not significantly impact the public or the environment due to exposure to any hazards or contamination sources.

Operational Impacts

The proposed project would be constructed on a project site with soil vapor contamination from LUST contaminant releases including PCE and benzene. PCE and benzene are hazardous chemical compounds at very low concentrations and can be mobilized in groundwater and released through soil vapor into structures located above the groundwater plumes. The soil sampling conducted for the proposed project determined that PCE and benzene were discovered at levels above environmental screening levels (ESL) which would represent a hazard for occupants of the project site. Based on the presence of PCE and benzene in the soil vapor, the proposed project would represent a risk of vapor intrusion for the public on the project site.

IMPACT HAZ-2.2 The proposed project would expose future residents to vapor intrusion on-site. **(Significant Impact)**

Mitigation Measure

MM HAZ-2.12: Based on the vapor intrusion risk on-site, implement a vapor intrusion mitigation (VIM) system to ensure the health and safety of the future project occupants. The project will submit a VIM System Plan to the Santa Clara County Department of Environmental Health (SCCDEH) for review and approval prior to the issuance of building permits. The proposed VIM system could include one or more of the following remediation measures: 1) sub-grade and/or sub-slab membranes, 2) gas-permeable gravel beneath the concrete slab/membrane, and 3) passive sub-slab ventilation. As previously mentioned, the final design of the VIM system will be decided in coordination with the SCCDEH to ensure the system meets all applicable thresholds.

With implementation of the mitigation measure above, the proposed project would control vapor intrusion on-site and would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Impact HAZ-3:	**The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. (Less than Significant Impact)**

The proposed project would be constructed within a quarter mile of Santa Clara University. The proposed project would result in the construction of a residential building with commercial uses on the ground floor. With the exception of common chemical cleansers, these uses are not associated with the emission or handling of hazardous materials; therefore, the proposed project would not result in the handling or emission on hazardous materials within a quarter mile of a school site and would result in a less than significant impact.

Impact HAZ-4:	**The project is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. However, with mitigation, the project would not create a significant hazard to the public or the environment. (Less than Significant Impact with Mitigation Incorporated)**

The project site is located on a Geotracker LUST Cleanup site identified on the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. As described above, based on historical uses of the site and soil and groundwater sampling, the soil on-site contains concentrations of petroleum compounds which are also contaminants of concern for the site. The proposed project would comply with policies governing construction and would implement mitigation measures MM HAZ 2.1 and MM HAZ 2.2 to reduce the hazards of construction created by the LUST and hazards presented to on-site residents. Therefore, the proposed project would create a less than significant hazard to the public or the environment with mitigation.

Impact HAZ-5:	**The project would be located within an airport land use plan. Nevertheless, the project would not result in a safety hazard or excessive noise for people residing or working in the project area. (Less than Significant Impact)**

The project site is located approximately 0.8 miles from the Norman Y. Mineta International Airport and is within the airplane traffic Airport Safety Zone established in the Comprehensive Land Use Plan. The proposed project would be substantially under 212 feet above mean sea level in height, which is the maximum building height for safe plane operations at the project site, and would not interfere with flight operations or pose a hazard to residents. Additionally, the proposed project is not located within the noise contours of the airport and would not experience excessive noise. Further, the proposed project would be reviewed by the ALUC prior to approval by the lead agency. Therefore, the project would not expose people residing or working in the project area to a safety hazard or excessive noise.

Impact HAZ-6:	**The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (No Impact)**

The project would be constructed in accordance with current building and fire codes and would be required to be maintained in accordance with applicable City policies identified in the General Plan to avoid unsafe building conditions. The proposed project would not alter routes of access, nor would it create impediments to existing emergency response plans or emergency evacuation plans in the City of Santa Clara. Therefore, the proposed project would result in no impact.

Impact HAZ-7:	**The project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. (No Impact)**

The proposed project is located in an urbanized environment and is not within a fire hazard severity zone. Therefore, the proposed project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

4.9.3 Non-CEQA Effects

Per *California Building Industry Association v. Bay Area Air Quality Management District,* 62 Cal. 4th 369 *(BIA v. BAAQMD)*, effects of the environment on the project are not considered CEQA impacts. The following discussion is included for informational purposes because the City of Santa Clara has policies that address existing hazards and hazardous materials conditions affecting a proposed project.

As discussed previously, the project shall implement Mitigation Measures HAZ-2.1 through HAZ-2.11 which would ensure that the site is fully remediated to meet the ESL thresholds for residential development (Included in Appendix C and D documents) and a case closure is issued by the RWQCB which would allow residential development to occur on-site. Additionally, the project would include the installation of a vapor barrier as described in Mitigation Measure HAZ-2.12 or other measures which would prevent soil vapor from affecting residents on the project site. As a result, the proposed project would not result in human health and environmental hazards to future site occupants consistent with the policies of the General Plan.

4.10 HYDROLOGY AND WATER QUALITY

4.10.1 Environmental Setting

4.10.1.1 *Regulatory Framework*

Federal and State

The federal Clean Water Act and California's Porter-Cologne Water Quality Control Act are the primary laws related to water quality in California. Regulations set forth by the EPA and the State Water Resources Control Board (SWRCB) have been developed to fulfill the requirements of this legislation. EPA regulations include the NPDES permit program, which controls sources that discharge pollutants into the waters of the United States (e.g., streams, lakes, bays, etc.). These regulations are implemented at the regional level by the RWQCBs. The project site is within the jurisdiction of the San Francisco Bay RWQCB.

National Flood Insurance Program

The Federal Emergency Management Agency (FEMA) established the National Flood Insurance Program (NFIP) to reduce impacts of flooding on private and public properties. The program provides subsidized flood insurance to communities that comply with FEMA regulations protecting development in floodplains. As part of the program, FEMA publishes Flood Insurance Rate Maps (FIRMs) that identify Special Flood Hazard Areas (SFHAs). An SFHA is an area that would be inundated by the one-percent annual chance flood, which is also referred to as the base flood or 100-year flood.

Statewide Construction General Permit

The SWRCB has implemented an NPDES General Construction Permit for the State of California (Construction General Permit). For projects disturbing one acre or more of soil, a Notice of Intent (NOI) must be filed with the RWQCB by the project sponsor, and a Stormwater Pollution Prevention Plan (SWPPP) must be prepared by a qualified professional prior to commencement of construction and filed with the RWQCB by the project sponsor. The Construction General Permit includes requirements for training, inspections, record keeping, and, for projects of certain risk levels, monitoring. The general purpose of the requirements is to minimize the discharge of pollutants and to protect beneficial uses and receiving waters from the adverse effects of construction-related stormwater discharges.

Regional and Local

San Francisco Bay Basin Plan

The San Francisco Bay RWQCB regulates water quality in accordance with the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). The Basin Plan lists the beneficial uses that the San Francisco Bay RWQCB has identified for local aquifers, streams, marshes, rivers, and the San Francisco Bay, as well as the water quality objectives and criteria that must be met to protect these uses. The San Francisco Bay RWQCB implements the Basin Plan by issuing and enforcing waste discharge requirements, including permits for nonpoint sources such as the urban runoff

discharged by a City's stormwater drainage system. The Basin Plan also describes watershed management programs and water quality attainment strategies.

Municipal Regional Permit Provision C.3

The San Francisco Bay RWQCB re-issued the MRP in 2015 to regulate stormwater discharges from municipalities and local agencies (co-permittees) in Alameda, Contra Costa, San Mateo, and Santa Clara Counties, and the cities of Fairfield, Suisun City, and Vallejo.[40] Under Provision C.3 of the MRP, new and redevelopment projects that create or replace 10,000 square feet or more of impervious surface area are required to implement site design, source control, and Low Impact Development (LID)-based stormwater treatment controls to treat post-construction stormwater runoff. LID-based treatment controls are intended to maintain or restore the site's natural hydrologic functions, maximizing opportunities for infiltration and evapotranspiration, and using stormwater as a resource (e.g. rainwater harvesting for non-potable uses). The MRP also requires that stormwater treatment measures are properly installed, operated, and maintained.

In addition to water quality controls, the MRP requires new development and redevelopment projects that create or replace one- acre or more of impervious surface to manage development-related increases in peak runoff flow, volume, and duration, where such hydromodification is likely to cause increased erosion, silt pollutant generation, or other impacts to local rivers, streams, and creeks. Projects may be deemed exempt from these requirements if they do not meet the minimized size threshold, drain into tidally influenced areas or directly into the Bay, or drain into hardened channels, or if they are infill projects in subwatersheds or catchment areas that are greater than or equal to 65 percent impervious.

Municipal Regional Permit Provision C.12.f

Provision C.12.f of the MRP requires co-permittee agencies to implement a control program for PCBs that reduces PCB loads by a specified amount during the term of the permit, thereby making substantial progress toward achieving the urban runoff PCBs wasteload allocation in the Basin Plan by March 2030.[41] Programs must include focused implementation of PCB control measures, such as source control, treatment control, and pollution prevention strategies. Municipalities throughout the Bay Area are updating their demolition permit processes to incorporate the management of PCBs in demolition building materials to ensure PCBs are not discharged to storm drains during demolition. Buildings constructed between 1955 and 1978 that are proposed for demolition must be screened for the presence of PCBs prior to the issuance of a demolition permit.

Water Resources Protection Ordinance and District Well Ordinance

The Santa Clara Valley Water District (Valley Water) operates as the flood control agency for Santa Clara County. Their stewardship also includes creek restoration, pollution prevention efforts, and groundwater recharge. Permits for well construction and destruction work, most exploratory boring for groundwater exploration, and projects within Valley Water property or easements are required under Valley Water's Water Resources Protection Ordinance and District Well Ordinance.

[40] MRP Number CAS612008
[41] San Francisco Bay Regional Water Quality Control Board. *Municipal Regional Stormwater Permit, Provision C.12.* November 19, 2015.

Dam Safety

Since August 14, 1929, the State of California has regulated dams to prevent failure, safeguard life, and protect property. The California Water Code entrusts dam safety regulatory power to California Department of Water Resources, Division of Safety of Dams (DSOD). The DSOD provide oversight to the design, construction, and maintenance of over 1,200 jurisdictional sized dams in California.[42]

As part of its comprehensive dam safety program, Valley Water routinely monitors and studies the condition of each of its 10 dams. Valley Water also has its own Emergency Operations Center and a response team that inspects dams after significant earthquakes. These regulatory inspection programs reduce the potential for dam failure.

Construction Dewatering Waste Discharge Requirements

Each of the RWQCBs regulate construction dewatering discharges to storm drains or surface waters within its region under the NPDES program and Waste Discharge Requirements.

City of Santa Clara 2010 – 2035 General Plan

General Plan policies applicable to hydrology and water quality include, but are not limited to, the following listed below.

Policies	Description
5.10.5-P11	Require that new development meet stormwater and water management requirements in conformance with state and regional regulations.
5.10.5-P13	Require that development complies with the Flood Damage Protection Code.
5.10.5-P15	Require new development to minimize paved and impervious surfaces and promote on-site Best Management Practices for infiltration and retention, including grassy swales, pervious pavement, covered retention areas, bioswales, and cisterns, to reduce urban water run-off.
5.10.5-P16	Require new development to implement erosion and sedimentation control measures to maintain an operational drainage system, preserve drainage capacity and protect water quality.
5.10.5-P17	Require that grading and other construction activities comply with the Association of Bay Area Governments' Manual of Standards for Erosion and Sediment Control Measures and with the California Stormwater Quality Association, Stormwater Best Management Practice Handbook for Construction.
5.10.5-P18	Implement the Santa Clara Valley Nonpoint Source Pollution Control Program, Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and the Urban Runoff Management Plan .
5.10.5-P20	Maintain, upgrade and replace storm drains throughout the City to reduce potential flooding.
5.10.5-P21	Require that storm drain infrastructure is adequate to serve all new development and is in place prior to occupancy.

[42] California Department of Water Resources, Division of Safety of Dams. Accessed June 9, 2020. https://water.ca.gov/Programs/All-Programs/Division-of-Safety-of-Dams#:~:text=Since%20August%2014%2C%201929%2C%20the,Safety%20of%20Dams%20(DSOD).

Santa Clara City Code

Chapter 13.20, Storms Drains and Discharges, of the SCCC is enacted for the protection of health, life, resources and property through prevention and control of unauthorized discharges into watercourses. The primary goal of this chapter is the cleanup of stormwater pollution from urban runoff that flows to creeks and channels, eventually discharging into the San Francisco Bay. The SCCC also includes Flood Damage Prevention Code (Chapter 15.45) and requirements for grading and excavation permits and erosion control (Chapter 15.15).

4.10.1.2 *Existing Conditions*

Groundwater

The project site is located in a confined area of the Santa Clara Valley groundwater basin and does not contribute to the recharging of the groundwater aquifer used for water supply. The depth to groundwater can vary seasonally, and can be influenced by underground drainage patterns, regional fluctuation, and other factors. The depth to groundwater, as measured within the groundwater monitoring wells, was estimated to be approximately four feet deep. The groundwater flow was reported to be north-northwest. The project site is not located within a designated groundwater recharge area.

Storm Drainage

The City of Santa Clara owns and maintains the municipal storm drainage system serving the project area. The storm drains near the project site are located within The Alameda and Park Avenue and water from the site flows southeast through stormwater systems, which flows east into the Guadalupe River and eventually to the San Francisco Bay. The project site is currently vacant and mostly unpaved, with approximately 17,890square feet (almost 100 percent) of the site covered with pervious surfaces and 51 square feet of impervious surfaces.

Flooding

The project site is not located within a 100-year flood hazard area. Based on the FEMA flood maps, the project site is located in Zone D which is an area with undetermined chance of flood.

Dam Failure

According to Valley Water dam failure maps, the project site is located within the Lexington Dam failure inundation hazard zone with depths of two to five feet.[43] The site is not located within the Anderson Dame failure inundation hazard zone [44]

[43] Valley Water. Lexington Dam Inundation Zone Map. Sheet 21. November 2019.
[44] Valley Water. Anderson Dam Inundation Zone Map. Sheet 11. November 2019.

4.10.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
2) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
3) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐
– result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
– substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☒	☐
– create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
– impede or redirect flood flows?	☐	☐	☒	☐
4) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
5) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

Impact HYD-1: The project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. (Less than Significant Impact)

Construction Impacts

Construction of the proposed project, including grading and excavation activities, would disturb soils within the project site. As a result, surface runoff after rain events may discharge a greater quantity of sediments to the stormwater system, which ultimately outfalls to the San Francisco Bay. The proposed project would, however, disturb less than one-acre of soil and would not be required to

comply with the NPDES General permit for construction activities to control the discharge of stormwater pollutants including sediments associated with construction activities. The following measures would be required by the City as conditions of project approval to reduce potential construction-related water quality impacts:

Conditions of Approval

- Burlap bags filled with drain rock shall be installed around storm drains to route sediment and other debris away from the drains;
- Earthmoving or other dust-producing activities would be suspended during period of high winds;
- All exposed or disturbed soil surfaces would be watered at least twice daily to control dust as necessary;
- Stockpiles of soil or other materials that can be blown by the wind would be watered or covered;
- All trucks hauling soil, sand, and other loose materials shall be covered;
- All paved access roads, parking areas, staging areas and residential streets adjacent to the construction sites would be swept daily (with water sweepers); and
- Vegetation in disturbed areas would be replanted as quickly as possible.

With the implementation of the above measures, construction related water quality impacts would be reduced to a less than significant level.

Post Construction Impacts

To reduce post-construction water quality impacts, the project is required to comply with the MRP. The MRP requires all post-construction stormwater runoff to be treated by numerically sized LID treatment controls, such as biotreatment facilities, unless the project is granted Special Project LID Reduction Credits, which would allow the project to implement non-LID measures for all or a portion of the site depending on the project characteristics. The proposed project includes LID measures to treat water flowing from 82 percent of the site and non-LID measures for the remaining 18 percent. The stormwater treatment measures include seven bioretention areas with liner and underdrains, two self-retaining areas, and a media filter system. Therefore, the proposed project, in compliance with existing regulations, would not result in significant impacts to water quality.

Impact HYD-2:	**The project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. (Less than Significant Impact)**

Although the project site is mostly unpaved, it does not substantially contribute to groundwater recharge. The proposed project would, therefore, not decrease groundwater supplies or interfere with groundwater recharge. The project would also implement LID stormwater treatment measures that would allow rainwater percolation on-site. The excavation associated with the underground parking and other below-grade work would likely encounter shallow groundwater; however, the project

would has a small footprint and would not interfere with groundwater flow. For these reasons, the project would have a less than significant impact on sustainable groundwater management.

Impact HYD-3:	**The project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or impede or redirect flood flows. (Less than Significant Impact)**

The proposed project is located within a watershed made up of more than 65 percent impervious surfaces. Therefore, the addition of impervious surfaces as part of the proposed project would not cause hydromodification in compliance with Santa Clara County C.3 technical guidance. Therefore, the proposed project would not result in the alteration of streams or rivers near the project site.

Additionally, the proposed project would replace more than 99 percent of the project site with impervious surfaces and would be required to provide stormwater treatment for the totality of the project site. The proposed project would include three drainage areas treated by a total of five flow-through planters. The existing project site is 100 percent pervious, and the proposed project would increase impervious surfaces to cover 99 percent of the site. A summary of the impervious surfaces is included in Table 4.10-1 below.

Table 4.10-1 Pervious and Impervious Surface Areas

	Impervious Surface	Pervious Surface
Existing Site Area (square feet)	51	17,890
Existing Percentage	0.2	98.8
Proposed Site Area (square feet)	17,814	127
Proposed Percentage	99	1.0

The flow-through planters would be sized compliant with Provision C.3 of the Municipal Regional Stormwater Permit. These bioretention areas provide landscaping designed to allow water to filter through the planter, and also allows for some water to evaporate away as it would in normal soil mediums. This slows the release of water into the stormwater system and would limit the surge of water from the new impervious surfaces during storm events. Therefore, the proposed project would not result in flooding or runoff exceeding the capacity of existing or planned stormwater drainage. Additionally, the treatment features would filter stormwater and the proposed project would not contribute as a source of polluted runoff. The proposed project would have a less than significant impact.

Impact HYD-4:	The project would not risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones. (Less than Significant Impact)

The project site is not located within tsunami hazard areas or located near an inland body of water which may result in seiches during seismic activity. The proposed project is located within the Lexington dam inundation zone, therefore, in the event of a dam failure the project site would be at risk of flooding. Valley Water maintains and repairs the reservoirs in their jurisdiction. As such, the increase the risk of site being inundation is minimal.

Additionally, the project site is within the FEMA Flood Hazard Zone D. This flood zone does not have a defined risk of flood. The proposed project would result in the creation of commercial and residential uses on-site. These uses are not associated with the use of pollutants, with the exception of household cleaners, and would not release significant amounts of pollutants into stormwater if flooding were to occur. Therefore, the proposed project would not result in significant release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones.

Impact HYD-5:	The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. (No Impact)

The proposed project would implement the conditions of project approval identified under Impact HYD-1, and the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and the Urban Runoff Management Plan (URMP). As described under Impact HYD-2, the project would not impact groundwater supplies or impede aquifer recharge. For these reasons, the proposed project would not conflict with, or obstruct implementation of, any water quality control plan or sustainable groundwater management plan.

4.11 LAND USE AND PLANNING

4.11.1 Environmental Setting

4.11.1.1 *Regulatory Framework*

Regional and Local

Santa Clara General Plan

The following land-use related General Plan policies are applicable to the proposed project.

Policies	Description
5.3.1-P9	Require new development provide adequate public services and facilities, infrastructure, and amenities to serve the new employment or residential growth.
5.3.2-P1	Encourage the annual construction of the housing units necessary to meet the City's regional housing needs assessment by reducing constraints to housing finance and development.
5.3.2-P6	Provide adequate choices for housing tenure, type and location, including higher density, and affordability for low- and moderate-income and special needs household.
5.4.1-P9	Residential development should include front doors, windows, stoops, porches, and bay windows or balconies along street frontages.
5.5.2-P12	Screen loading and trash areas to preclude visibility from off-site and public streets.

City of Santa Clara Zoning Code

The City's Zoning Code regulates land uses within the boundaries of Santa Clara. The overall goals of the Zoning Code are to promote the city's growth in an orderly manner and to promote and protect the public health, safety, peace, comfort, and general welfare in conformance with the General Plan. For each of the zoning districts in the city, the Code identifies land uses that are permitted, conditionally permitted, and not permitted. It also establishes standards such as minimum lot size, maximum building height, and the minimum distance buildings must be set back from the street. Provisions for parking, landscaping, lighting, and other rules that guide the development of projects in the city are also included.

4.11.1.2 *Existing Conditions*

The project site is a vacant site. The project site is currently zoned Neighborhood Commercial and is designated Neighborhood Mixed Use in the General Plan.

Neighborhood Commercial zoning allows commercial uses that are appropriate to serve local communities and is intended to provide retail goods and services for the convenience of the immediately adjacent residential neighborhood.

The General Plan designation of Neighborhood Mixed Use is a combination of the Community Commercial and Medium Density Residential designations and is intended to encourage a mix of residential and commercial uses along major streets.

Auto-oriented uses are not appropriate in this designation, except under certain circumstances within the El Camino Real Focus Area. Parking should be behind buildings, below-grade or in structures, to ensure that active uses face public streets. Retail, commercial and neighborhood office uses, at a minimum FAR of 0.10, are required in conjunction with residential development between 20 and 36 units per acre.

The land uses around the project site include a mix of residential, and commercial uses, as well as Santa Clara University. North and east of the project site is Santa Clara University and its associated dormitory residential uses. West of the site there are commercial uses, including multiple restaurant service businesses, and beyond these is a neighborhood of single and multi-family residences.

4.11.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Physically divide an established community?	☐	☐	☐	☒
2) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

Impact LU-1: The project would not physically divide an established community. (No Impact)

The proposed project would develop an existing vacant site in an area of mixed residential and commercial uses. This would not result in obstructive infrastructure (like a freeway) or barriers to movement surrounding the site and would not physically separate the existing community from local amenities or isolate residences. Therefore, the proposed project would have no impact from division of established communities.

Impact LU-2: The project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. (Less than Significant Impact)

As described within the individual sections of this document, with incorporation of the Conditions of Approval, mitigation measures, and regulatory requirements the project would not cause a significant environmental impact due to a conflict with plans, policies or regulations adopted for the purpose of avoiding or mitigating an environmental effect. The proposed development project would be reviewed for compliance with applicable land use plans and policies. As a result, the impact is less than significant.

The proposed development project includes a General Plan Amendment to change the General Plan designation of the project site from Neighborhood Mixed Use to Very High-Density Residential.

This designation allows for residential development from 51 to 100 du/ac and is intended to take advantage of proximity to transit, offering an urban feel and typically comprised of mid to high rise buildings featuring structured or below grade parking and shared outdoor space. Unlike the Very High Density Mixed Use designation, this designation also allows for ground floor retail and other compatible uses that activate the street without a minimum or maximum FAR requirement.

The current land use designation provides a maximum of 36 units per acre on the site with a FAR of 0.10. The new General Plan designation would allow for a maximum of 100 units per acre. The 0.4-acre site would currently allow up to 36 units per acre for a total of 14 units under current conditions; whereas up to 40 units would be permitted under the proposed General Plan Amendment. This would result in an increase in population and resource consumption higher than the levels analyzed in the General Plan Integrated Final Environmental Impact Report (FEIR).

The proposed development project would provide 39 residential units on-site, which would be an increase of 25 units above the maximum allowed under the current General Plan designation. The General Plan included a net increase of 2,957 dwelling units throughout the City. The increase in housing allowed on-site would be approximately 1.3 percent of the total planned housing planned for the City of Santa Clara. Therefore, this would not represent a significant amount of growth on the project site. The proposed development project would comply with Conditions of Approval, mitigation measures, and regulatory requirements included as part of the General Plan, Therefore, the proposed development project would result in a less than significant impact related to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

4.12 MINERAL RESOURCES

4.12.1 Environmental Setting

4.12.1.1 *Regulatory Framework*

State

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act (SMARA) was enacted by the California legislature in 1975 to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of surface mining to public health, property, and the environment. As mandated under SMARA, the State Geologist has designated mineral land classifications in order to help identify and protect mineral resources in areas within the state subject to urban expansion or other irreversible land uses which would preclude mineral extraction. SMARA also allowed the State Mining and Geology Board (SMGB), after receiving classification information from the State Geologist, to designate lands containing mineral deposits of regional or statewide significance.

4.12.1.2 *Existing Conditions*

The City of Santa Clara is located in an area zoned MRZ-1, which classifies an area where adequate information indicates that no significant mineral deposits are present. The area is not known to support significant resources of any other type. No mineral resources are currently being extracted in the City. The State Office of Mine Reclamation's list of mines (the AB 3098 List) regulated under the Surface Mining and Reclamation Act (SMARA) does not include any mines within the City.[45]

4.12.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
2) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

[45] City of Santa Clara. 2010-2035 General Plan Integrated Final EIR. January 2011.

Impact MIN-1:	**The project would not result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state. (No Impact)**

As stated above, the proposed project is located in an area where no mineral resources exist or are expected to be encountered. Therefore, the proposed project would not impact the availability of a known mineral resource that would be of value to the region and residents of the state.

Impact MIN-2:	**The project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. (No Impact)**

As stated above, the proposed project is located in an area where no mineral resources exist or are expected to be encountered. Therefore, the proposed project would not impact the availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

4.13 NOISE

The information in this section is based in part on the 2655 The Alameda Noise and Vibration Assessment prepared by Illingworth and Rodkin Inc., on September 19, 2022. This study is included in Appendix E of this document.

4.13.1 Environmental Setting

Noise

Factors that influence sound as it is perceived by the human ear, include the actual level of sound, period of exposure, frequencies involved, and fluctuation in the noise level during exposure. Noise is measured on a decibel scale, which serves as an index of loudness. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness. Because the human ear cannot hear all pitches or frequencies, sound levels are frequently adjusted or weighted to correspond to human hearing. This adjusted unit is known as the A-weighted decibel, or dBA.

Since excessive noise levels can adversely affect human activities and human health, federal, state, and local governmental agencies have set forth criteria or planning goals to minimize or avoid these effects. Noise guidelines are generally expressed using one of several noise averaging methods, including L_{eq}, DNL, or CNEL.[46] These descriptors are used to measure a location's overall noise exposure, given that there are times when noise levels are higher (e.g., when a jet is taking off from an airport or when a leaf blower is operating) and times when noise levels are lower (e.g., during lulls in traffic flows on freeways or in the middle of the night). L_{max} is the maximum A-weighted noise level during a measurement period.

Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Vibration amplitude can be quantified using Peak Particle Velocity (PPV), which is defined as the maximum instantaneous positive or negative peak of the vibration wave. PPV has been routinely used to measure and assess ground-borne construction vibration. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 inches/second (in/sec) PPV.

4.13.1.1 *Regulatory Framework*

Federal

Federal Transit Administration Vibration Limits

The Federal Transit Administration (FTA) has developed vibration impact assessment criteria for evaluating vibration impacts associated with transit projects. The FTA has proposed vibration impact

[46] L_{eq} is a measurement of average energy level intensity of noise over a given period of time. Day-Night Level (DNL) is a 24-hour average of noise levels, with a 10 dB penalty applied to noise occurring between 10:00 PM and 7:00 AM. Community Noise Equivalent Level (CNEL) includes an additional five dB applied to noise occurring between 7:00 PM and 10:00 PM. Where traffic noise predominates, the CNEL and DNL are typically within two dBA of the peak-hour L_{eq}.

criteria based on maximum overall levels for a single event. The impact criteria for groundborne vibration are shown in Table 4.13-1 below. These criteria can be applied to development projects in jurisdictions that lack vibration impact standards.

Table 4.13-1: Groundborne Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB inch/sec)		
	Frequent Event	Occasional Events	Infrequent Events
Category 1: Buildings where vibration would interfere with interior operations	65	65	65
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime use	75	78	83

Source: Federal Transit Administration. *Transit Noise and Vibration Assessment Manual.* September 2018.

State and Local

California Building Code

The CBC establishes uniform minimum noise insulation performance standards to protect persons within new buildings housing people, including hotels, motels, dormitories, apartments, and dwellings other than single-family residences. Title 24 mandates that interior noise levels attributable to exterior sources not exceed 45 L_{dn}/CNEL in any habitable room. Exterior windows must have a minimum Sound Transmission Class (STC) of 40 or Outdoor-Indoor Transmission Class (OITC) of 30 when the property falls within the 65 dBA DNL noise contour for a freeway or expressway, railroad, or industrial source.

City of Santa Clara General Plan

The City's General Plan contains noise goals and policies in Chapter 5, Section 5.10.6. These goals and policies identify Normally Acceptable noise exposures for various land uses, including limits of 60 dB CNEL for residential exteriors and 45 dB CNEL for residential interiors. The standards also specify an interior limit of 50 dB CNEL for offices, retail and other less sensitive indoor spaces.

The General Plan also identifies the following policies that would be applicable to the project.

Policy	Description
5.10.6-P1	Review all land use and development proposals for consistency with the General Plan Compatibility standards and acceptable noise exposure levels.
5.10.6-P2	Incorporate noise attenuation measures for all projects that have noise exposure levels greater than General Plan "normally acceptable" levels.
5.10.6-P3	New development should include noise control techniques to reduce noise to acceptable levels, including site layout (setbacks, separation and shielding), building treatments (mechanical ventilation system, sound-rated windows, solid core doors and baffling) and structural measures (earthen berms and sound walls).
5.10.6-P4	Encourage the control of noise at the source through site design, building design, landscaping, hours of operation and other techniques.
5.10.6-P5	Require noise-generating uses near residential neighborhoods to include solid walls and heavy landscaping along common property lines, and to place compressors and mechanical equipment in sound-proof enclosures.

Santa Clara City Code

Section 9.10.040 of the SCCC establishes noise level performance standards for fixed sources of noise, as seen below in Schedule A. Noise levels at single-family residences, multi-family residences, and at public spaces are limited to 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA at night (10:00 p.m. to 7:00 a.m.). Noise levels at commercial and office uses are limited to 65 dBA during daytime hours and 60 dBA during nighttime hours. Section 9.10.060the states that if the measured ambient noise level at any given location differs from those levels set forth in Schedule A, the allowable noise exposure standard shall be adjusted in five dBA increments in each category as appropriate to encompass or reflect the ambient noise level.

Schedule A		
Receiving Zone	**Noise Level (dBA)**	
	7:00am – 10:00 pm	**10:00 pm – 7:00 am**
Single-family and duplex residential	55	50
Multiple-family residential, public space	55	50
Commercial, Office	65	60
Light Industrial	70	70
Heavy Industrial	75	75

Section 9.10.230 prohibits construction activities permitted within 300 feet of residentially zoned property except within the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays. No construction is permitted on Sundays or holidays. Section 9.10.070 exempts construction activities which occur during allowed hours from Schedule A noise limits.

The SCCC does not define the acoustical time descriptor such as L_{eq} (the average noise level) or L_{max} (the maximum instantaneous noise level) that is associated with the above limits. A reasonable interpretation of the SCCC would identify the ambient base noise level criteria as an average or median noise level (L_{eq}/L_{50}).

4.13.1.2 *Existing Conditions*

Noise in the project area is generated primarily by traffic on The Alameda and the surrounding roadways. Based on field surveys conducted by Illingworth and Rodkin on Monday September 12, 2022 the average noise on-site ranged from 54 to 63 dBA on average throughout the day.[47] Because the site is vacant, there are no noise-generating activities on-site.

The project site is located approximately 0.85 miles west of the nearest airport, Norman Y. Mineta International Airport. The site is outside the 60 dBA contour for the airport noise impacts.[48]

4.13.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in:				
1) 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?	☐	☒	☐	☐
2) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
3) 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, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Impact NOI-1:	**As mitigated, the project would not result in 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. (Less than Significant Impact with Mitigation Incorporated)**

Construction Noise

Construction of the proposed project would take place over the course of approximately one and a half years with construction proposed from 7:00 am to 6:00 pm Monday through Friday. The excavation on-site would remove approximately 7,400 cubic yards of soil. The proposed project would not require demolition, or foundation construction involving pile driving. During each phase

[47] Illingworth and Rodkin. 2655 The Alameda Noise and Vibration Assessment. September 19, 2022.
[48] Bridgenet International. Norman Y. Mineta San Jose International Airport Noise Assessment for the Master Plan Environmental Impact Report. October 2019.

of construction, there would be a different mix of equipment operating, and noise levels would vary, based on the amount of equipment and the location at which the equipment is operating. The SCCC limits construction activities (including the loading and unloading of materials and truck movements) within 300 feet of residentially zoned property to the hours of 7:00 a.m. to 6:00 p.m. on weekdays and between the hours of 9:00 a.m. and 6:00 p.m. on Saturdays. No construction is permitted on Sundays or holidays.

The City of Santa Clara does not establish noise level thresholds for construction activities. As an alternative, this analysis uses the noise limits established by the 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. During daytime hours, an exterior threshold of 80 dBA Leq shall be enforced at residential land uses and 90 dBA Leq shall be enforced at commercial and industrial land uses.

The typical range of maximum instantaneous noise levels for the proposed project would be 70 to 90 dBA Lmax at a distance of 50 feet from the equipment. Construction-generated noise levels drop off at a rate of about six dBA per doubling of the distance between the source and receptor. Obstruction by buildings or landmass would often result in lower construction noise levels at distant receptors.

Equipment expected to be used in each construction phase is summarized in Table 4.13-2, along with the quantity of each type of equipment, the reference noise level at 50 feet assuming the operation of the two loudest pieces of construction equipment, and the estimated noise levels at the nearest property lines projected from the center of the construction activity by phase.

Table 4.13-2 Construction Noise Levels

Phase (Work Days)	Construction Equipment (Quantity)	Calculated Hourly Average Leq (dBA) From Operation of Two Loudest Pieces of Construction Equipment		
		50 feet	70 feet	100 feet
Site Preparation (1 day)	Tractor/Loader/Backhoe (1)	80	77	74
Grading (44 days)	Excavator (1) Tractor/Loader/Backhoe (1)	82	79	76
Trenching (124 days)	Crane (1) Forklift (2)	74	71	68
Building – Exterior (163 days)	Crane (1) Welder (1) Forklift (1)	75	72	69
Building – Interior (138 days)	Air Compressor (4)	77	74	71
Paving (28 days)	Paver (1) Paving Equipment (1) Roller (1) Tractor/Loader/Backhoe (2) Concrete Saw (1)	85	82	79

Source: Illingworth and Rodkin. 2655 The Alameda Noise and Vibration Assessment. September 19, 2022.

As shown in Table 4.13-2, construction noise levels would range from 74 to 85 dBA Leq at a distance of 50 feet. The nearest receptors to the west are about 70 feet from the project boundary, while the nearest receptors to the northeast are approximately 100 feet from the site. Construction noise levels would exceed the exterior threshold of 80 dBA Leq at residential land uses to the west during the paving phase when activities occur within a distance of 90 feet. Construction noise levels would not exceed 90 dBA Leq at commercial land uses in the project vicinity. Since project construction would last approximately one and a half years and, at times, produce noise levels exceeding 80 dBA Leq at nearby residences, this construction impact would be considered significant.

IMPACT NOI–1.1 Construction of the proposed project would result in construction noise exceeding 80 dBA at residential uses near the project site.

Mitigation Measure

MM-NOI 1.1-1 Project construction operations shall use best available noise suppression devices and techniques including, but not limited to the following:

- Limit construction hours to between 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 9:00 a.m. and 6:00 p.m. on Saturdays. No construction is permitted on Sundays or holidays.
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibit unnecessary idling of internal combustion engines.
- Locate stationary noise-generating equipment such as air compressors or portable power generators as far as possible from sensitive receptors. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses.
- Utilize “quiet” air compressors and other stationary noise sources where technology exists.
- Control noise from construction workers’ radios to a point where they are not audible at existing residences bordering the project site.
- Notify all adjacent business, residences, and other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of “noisy” construction activities to adjacent land uses and nearby residences.
- Designate a “disturbance coordinator” who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to current the problem. 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 schedule.

With the implementation of the above measures, the construction noise impact would be reduced to a less than significant level.

Operational Noise

During operation of the proposed project, a significant impact would occur if the permanent noise level increase due to project-generated traffic was three dBA CNEL or greater for future ambient noise levels exceeding 60 dBA CNEL. Additionally, the City Code establishes noise level performance standards for fixed sources of noise. Section 9.10.40 of the City Code limits noise levels at residences to 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA at night (10:00 p.m. to 7:00 a.m.). The primary two sources of operational noise would result from new traffic trips and mechanical equipment located throughout the project site.

Traffic Noise

Based on the project trip generation, estimated as a part of the transportation assessment conducted by Hexagon Transportation Consultants, the project would result in 214 new trips per day, with 15 new trips in the AM peak hour and 19 new trips in the PM peak hour. This small increase in daily/hourly trips would not measurably increase traffic noise levels along The Alameda or Park Avenue. Noise from vehicles utilizing the driveway would be similar to existing noise levels produced by surface parking at the Safeway Center, and noise occurring in the below grade parking garage would be less. The overall change in the noise environment due to vehicles associated with the project would be approximately zero dBA CNEL.

Mechanical Equipment

Mechanical equipment for heating, ventilation, and cooling purposes, exhaust fans, and other similar equipment would likely be located on the roof of the proposed building within mechanical equipment wells. The primary noise sources on the roof of the building would be the air conditioning condensing units, which would run intermittently based on the heating or cooling needs. To represent a worst-case scenario, up to eight clustered units were modeled to run continuously, producing hourly average noise levels of 75 dBA Leq at a distance of three feet. The nearby receptors would not have direct line-of-sight to the rooftop equipment; therefore, worst-case noise levels were calculated to be 33 dBA Leq or less assuming the distance from the equipment to the receivers and the shielding provided by the rooftop edge of the building. The associated noise levels from the mechanical equipment would be 39 dBA CNEL or less at the nearest receptor to the west, which would not exceed the daytime or nighttime City Code noise limits, nor measurably contribute to ambient noise levels in the project vicinity.

The project also proposes two mechanical equipment rooms within the underground parking garage (for a boiler, electrical equipment, etc.). The underground location of this equipment would provide adequate shielding for all surrounding noise-sensitive receptors and would not result in increase to ambient noise during operations.

While the project, as designed, would not result in significant operational noise impacts, the following Condition of Approval will be required to further reduce noise levels.

Condition of Approval

- As a project condition of approval, mechanical equipment shall be selected and designed to reduce noise levels to meet the City Code requirements at the nearby noise-sensitive land uses. A qualified acoustical consultant shall be retained to review mechanical noise as these systems are selected to determine specific noise reduction measures necessary to reduce noise to comply with the City Code noise level requirements. Noise reduction measures could include, but are not limited to, selection of equipment that emits low noise levels and installation of noise barriers, such as enclosures and parapet walls, to block the line-of-sight between the noise source and the nearest receptors. Other alternate measures may be optimal, such as locating equipment in less noise-sensitive areas, such as along the building façades farthest from adjacent neighbors, where feasible.

Due to the size of the project, the operational noise levels produced by the project would be well below ambient noise levels produced by local vehicle traffic, and would not substantially increase the ambient noise environment at the nearest noise-sensitive receptors, resulting in a less than significant impact.

Impact NOI-2:	**The project would not result in generation of excessive groundborne vibration or groundborne noise levels. (Less than Significant Impact)**

Construction Vibration

The construction of the project may result in vibration that can be felt at surrounding buildings when heavy equipment or impact tools are used during site preparation, grading, trenching, building construction, and paving. Foundation work would not involve impact or vibratory pile driving equipment, which can cause excessive vibration.

No known ancient ruins or monuments or buildings that are documented to be structurally weakened adjoin the project area and the nearest historic building is the John C. McPherson House located approximately 1,200 feet to the west at 561 Washington Street. Therefore, since the buildings surround the site are structurally stable, groundborne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a significant vibration impact at standard construction buildings in the site vicinity.

Vibration levels vary depending on soil conditions, construction methods, and equipment used. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and tracked vehicles may generate substantial vibration in the immediate vicinity of the project site. Vibratory levels of common construction equipment are summarized in Table 4.13-3 along with the expected vibratory levels at areas around the project site.

Table 4.13-3 Vibration Levels for Construction Equipment					
Equipment		**PPV at 25 feet (in/sec)**	**Estimated Vibration Levels at Structures Surrounding the Project Site, in/sec PPV**		
			West Residential (80 feet)	**Northeast Educational (120 feet)**	**South Commercial (240 feet)**
Clam shovel drop		0.202	0.056	0.036	0.017
Hydromill (slurry wall)	In Soil	0.008	0.002	0.001	0.001
	In Rock	0.017	0.005	0.003	0.001
Vibratory Roller		0.210	0.058	0.037	0.017
Hoe Ram		0.089	0.025	0.016	0.007
Large bulldozer		0.089	0.025	0.016	0.007
Caisson drilling		0.089	0.025	0.016	0.007
Loaded trucks		0.076	0.021	0.014	0.006
Jackhammer		0.035	0.010	0.006	0.003
Small bulldozer		0.003	0.001	0.001	0.000
Source: Illingworth and Rodkin. 2655 The Alameda Noise and Vibration Assessment. September 19, 2022.					

Vibration levels are highest close to the source, and then decrease with distance from the project site. Table 4.13-3 above shows that the nearest uses (80 to 240 feet from the site) would experience vibratory impacts less than the 0.3 in/sec PPV threshold. At these locations, and in other surrounding areas where vibration would not be expected to cause cosmetic damage, vibration levels may still be perceptible. However, as with any type of construction, this is anticipated and would not be considered significant, given the intermittent and short duration of the phases that have the highest potential of producing vibration (use of jackhammers and other high-power tools). Therefore, the proposed project would result in less than significant construction vibrations.

Operational Vibration

The proposed project would not operate vibration generating machinery on-site and would not result in continued heavy truck traffic post-construction which could cause vibration at surrounding areas. Therefore, the proposed project would not result in operational vibratory impacts.

Impact NOI-3: The project would be located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has been adopted, within two miles of a public airport or public use airport. The project would not expose people residing or working in the project area to excessive noise levels. (Less than Significant Impact)

The proposed project is located within one mile of the Norman Y. Mineta Airport. Although the project site is near to the airport, the site is located outside the 60 dBA aircraft noise contour and would not result in the exposure of people residing or working in an area with excessive noise. Therefore, the proposed project would have a less than significant impact in relation to aircraft noise impacts.

4.13.3 Non-CEQA Effects

Per *California Building Industry Association v. Bay Area Air Quality Management District,* 62 Cal. 4th 369 *(BIA v. BAAQMD)*, effects of the environment on the project are not considered CEQA impacts. The following discussion is included for informational purposes only because the City of Santa Clara has policies that address existing noise conditions affecting a proposed project.

Exterior Noise Environment Effects on New Residents

The future noise environment at the site would continue to result primarily from vehicular traffic along nearby roadways. This analysis conducted as part of the Noise and Vibration Assessment conservatively assumes that the noise would be approximately 67 dBA CNEL at about 45 feet from the center of The Alameda and 64 dBA CNEL at about 25 feet from the center of Park Avenue.

The centrally located courtyard for residential use on the second floor and partially shielded outdoor residential patios on the third and fourth floors are the primary outdoor spaces which new residents would use for recreation. Future exterior noise levels at the courtyard would be attenuated by the building itself and were calculated to be 58 to 60 dBA CNEL. The unshielded outdoor patios facing The Alameda would be exposed to exterior noise levels reaching approximately 65 dBA CNEL, however residents would have the option of selecting the lower noise courtyard for a quiet outdoor environment.

Exterior noise levels would exceed the City's 55 dBA CNEL "compatible" threshold without additional noise control. This would be in conflict with General Plan policy 5.10.6-P2 which requires noise attenuation for sounds exceeding "normally acceptable" levels.

Condition of Approval

- The project would be required to implement one or more design features which would reduce the ambient noise levels at the primary outdoor spaces below the City's 55 dBA CNEL threshold. This could include closing off the open side of the building (i.e., putting up a wall with sealed windows on each floor with a central courtyard or occupiable open space area) or other measures. The design features will be determined during the building permit stage in consultation with City staff and an acoustical professional. Once the design features are determined, the acoustical professional will be required to provide the City with a report demonstrating the effectiveness of the measure(s) to meet the City's applicable noise threshold. This report must be reviewed and approved prior to the issuance of any building permits.

Future Interior Noise Environment Effects on New Residents

Standard residential design provides approximately 15 dBA of exterior-to-interior noise reduction, assuming the windows are partially open for ventilation. Standard design with the windows closed provides approximately 20 to 25 dBA of noise reduction in interior spaces. Where exterior noise levels range from 60 to 65 dBA CNEL, the inclusion of adequate mechanical ventilation would reduce interior noise levels by closing the windows to control noise. Where noise levels exceed 65 dBA CNEL, mechanical ventilation systems and other noise reducing design features, such as

smaller window and door sizes, sound-rated windows and doors, and sound-rated exterior wall assemblies, are normally required.

The worst-case exterior noise exposure would occur at the units nearest the intersection of The Alameda and Park Avenue where the traffic noise levels would reach approximately 68 dBA CNEL. Assuming windows are partially open for ventilation, future interior noise levels in these units would reach approximately 53 dBA CNEL.

Street level retail shops are proposed at the north end of the site where noise levels are calculated to reach 68 dBA CNEL. Standard design features for commercial uses would provide about 25 dBA of noise reduction in interior spaces. Additionally, the inclusion of adequate mechanical ventilation systems is normally required so that windows may be kept closed to reduce noise by an additional five dBA. With these standard design features incorporated the commercial spaces would not exceed the interior daytime threshold of 50 dBA Leq.

Conditions of Approval

The following noise insulation features shall be incorporated into the proposed project to reduce interior noise levels to 45 dBA CNEL or less at residential interiors consistent with General Plan Policy 5.10.6-P2:

- Provide a suitable form of forced-air mechanical ventilation, as determined by the City's local Building Official, so that windows can be kept closed at the occupant's discretion to control interior noise and achieve the interior noise standards. Preliminary calculations indicate that worst-case units on the perimeter of the building would require windows and doors having a minimum rating of 26 to 30 STC in order to achieve the interior noise threshold of 45 dBA CNEL.
- A qualified acoustical specialist shall prepare a detailed analysis of interior residential noise levels resulting from all exterior sources during the design phase pursuant to requirements set forth in the Santa Clara General Plan and California Building Code. The study will review the final site plan, building elevations, and floor plans prior to construction and recommend building treatments to reduce residential interior noise levels to 45 dBA CNEL or lower. Treatments would include, but are not limited to, sound-rated windows and doors, sound-rated wall and window constructions, acoustical caulking, protected ventilation openings, etc. The specific determination of what noise insulation treatments are necessary shall be conducted on a unit-by-unit basis during final design of the project. Results of the analysis, including the description of the necessary noise control treatments, shall be submitted to the City, along with the building plans and approved design, prior to issuance of a building permit.

4.14 POPULATION AND HOUSING

4.14.1 Environmental Setting

4.14.1.1 *Regulatory Framework*

State

Housing-Element Law

State requirements mandating that housing be included as an element of each jurisdiction's general plan is known as housing-element law. The Regional Housing Need Allocation (RHNA) is the state-mandated process to identify the total number of housing units (by affordability level) that each jurisdiction must accommodate in its housing element. California housing-element law requires cities to: 1) zone adequate lands to accommodate its RHNA; 2) produce an inventory of sites that can accommodate its share of the RHNA; 3) identify governmental and non-governmental constraints to residential development; 4) develop strategies and a work plan to mitigate or eliminate those constraints; and 5) adopt a housing element and update it on a regular basis.[49] The City of Santa Clara Housing Element and related land use policies were last updated in 2015.

Regional and Local

Plan Bay Area 2050

Plan Bay Area 2050 is a long-range plan for the nine-county San Francisco Bay Area that provides strategies that increase the availability of affordable housing, support a more equitable and efficient economy, improve the transportation network, and enhance the region's environmental resilience. Plan Bay Area 2050 promotes the development of a variety of housing types and densities within identified Priority Development Areas (PDAs). PDAs are areas generally near existing job centers or frequent transit that are locally identified for housing and job growth.[50]

ABAG allocates regional housing needs to each city and county within the San Francisco Bay Area, based on statewide goals. These allocations are designed to lay the foundation for Plan Bay Area 2050's long-term envisioned growth pattern for the region. ABAG also develops a series of forecasts and models to project the growth of population, housing units, and jobs in the Bay Area. ABAG, MTC, and local jurisdiction planning staff created the Forecasting and Modeling Report, which is a technical overview of the growth forecasts and land use models upon which Plan Bay Area 2050 is based.

Santa Clara General Plan

General Plan policies related to population and housing that are relevant to the project include the following.

[49] California Department of Housing and Community Development. "Regional Housing Needs Allocation and Housing Elements" Accessed December 9, 2020. http://hcd.ca.gov/community-development/housing-element/index.shtml.

[50] Association of Bay Area Governments and Metropolitan Transportation Commission. *Plan Bay Area 2050*. October 21, 2021. Page 20.

Policy	Description
5.3.2-P1	Encourage the annual construction of the housing units necessary to meet the City's regional housing needs assessment by reducing constraints to housing finance and development.
5.3.2-P2	Encourage higher-density residential development in transit and mixed-use areas and in other locations throughout the City where appropriate.
5.3.2-P6	Provide adequate choices for housing tenure, type and location, including higher density, and affordability for low- and moderate-income and special needs households.

4.14.1.2 *Existing Conditions*

According to the California Department of Finance, the City had a population of approximately 130,127 residents in 48,391 households as of May 2022.[51] Of the 130,127 residents, approximately 50 percent are employed residents.[52] There are approximately 137,000 jobs in the City (estimated by ABAG for 2020). In 2035, it is estimated that the City will have approximately 154,825 residents, 54,830 households, 154,300 jobs and 72,080 employed residents.[53]

The jobs/housing relationship is quantified by the jobs/employed resident ratio. When the ratio reaches 1.0, a balance is struck between the supply of local housing and jobs. The jobs/housing resident ratio is determined by dividing the number of local jobs by the number of employed residents that can be housed in local housing.

The City of Santa Clara had an estimated 2.50 jobs for every employed resident in 2010.[54] The General Plan focuses on increased housing and the placement of housing near employment. As a result, the jobs to housing ratio is projected to slightly decrease to 2.48 by 2040.[55] Some employees who work within the City are, and still would be, required to seek housing outside the community with full implementation of the General Plan.

The existing project site is vacant and does not contribute to the current permanent resident population of the City.

[51] California Department of Finance. "E-5 City/County Population and Housing Estimates." May 2022. Accessed: June, 2022. http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.
[52] Association of Bay Area Governments. Plan Bay Area: Projections 2013. December 2013.
[53] City of Santa Clara. 2010-2035 General Plan. December 2014.
[54] City of Santa Clara 2010-2035 General Plan. December 2014. Appendix 8.12 (Housing Element). Page 8.12-25.
[55] City of Santa Clara 2010-2035 General Plan Final Environmental Impact Report. 2011.

4.14.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
2) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Impact POP-1: The project would not induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure). (Less than Significant Impact)

The project site is currently undeveloped. The proposed project would result in an increase of approximately 1,540 square feet of commercial space and 39 residential units on-site. The 39 residential units would result in approximately 102 residents, a net increase of approximately 65 residents over the maximum residential development assumed for the site in the General Plan.[56] This would be a minimal increase in the overall population of the City of Santa Clara and would be generally consistent with the City's planned growth. For these reasons, the proposed development project would not result in substantial unplanned population growth.

Impact POP-2: The project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. (No Impact)

The proposed project would develop a vacant site and would not result in the demolition of existing housing. Therefore, the proposed project would not result in impacts from the displacement of existing population or housing.

[56] 39 residential units x 2.61 residents per unit = 102 residents
Source: California Department of Finance, E-5 Population and Housing Estimates for Cities, Counties, and the State, 2020-2022, available at http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/, accessed July 21, 2022.

4.15 PUBLIC SERVICES

4.15.1 Environmental Setting

4.15.1.1 *Regulatory Framework*

State

Quimby Act-California Code Section 66477

The Quimby Act (California Government Code Section 66477) was approved by the California legislature to set aside parkland and open space for recreational purposes. It provides provisions for the dedication of parkland and/or payment of fees due in lieu of parkland dedication to help mitigate the impacts from new residential developments. This legislation was initiated in 1980's in response to California's increased rate of urbanization and the need to preserve open space and provide parks and recreation facilities for California's growing communities. The Quimby Act authorizes local governments to establish ordinances requiring developers of new residential subdivisions to dedicate parkland, pay a fee in-lieu of parkland dedication, or perform a combination of the two at the discretion of the City.

Mitigation Fee Act.

In 1989, the State Legislature passed Assembly Bill 1600 (AB1600), adding Section 66000 et seq. to the California Government Code (the "Mitigation Fee Act"), which sets forth requirements for local agencies to follow if they collect fees from developers to defray the cost of the construction of public facilities related to development projects. These legal requirements are frequently referred to as "AB 1600 requirements." Each local agency imposing such development impact fees must prepare an annual report providing specific information about these fees (i.e., a "nexus study") that shows the proper connection of the fees to the project and how accounting and reporting for the fees collected are regulated.

School Impact Fees

California Government Code Section 65996 specifies that an acceptable method of offsetting a project's effect on the adequacy of school facilities is the payment of a school impact fee prior to the issuance of a building permit. Sections 65995-65998 set forth provisions for the payment of school impact fees by new development for "mitigating impacts on school facilities that occur (as a result of the planning, use, or development of real property" (Section 65996[a])). The legislation goes on to say that the payment of school impact fees "are hereby deemed to provide full and complete school facilities mitigation" under CEQA (Section 65996[b]).

In accordance with California Government Code Section 65996, developers pay a school impact fee to the school district to offset the increased demands on school facilities caused by their proposed residential development projects. The school district is responsible for implementing the specific methods for mitigating school impacts under the Government Code.

Regional and Local

City of Santa Clara 2010 – 2035 General Plan

The City of Santa Clara 2010-2035 General Plan includes policies and programs to provide public services throughout the City. Applicable General Plan policies include, but are not limited to, the following listed below.

Policies	Description
Parks, Open Space and Recreation	
5.4.3-P3	Provide pedestrian-oriented ground floor uses and a network of parks and public spaces to serve both residential and non-residential development.
5.9.3-P1	Encourage design techniques that promote public and property safety in new development and public spaces.
5.9.1-P2	Develop new parks to serve the needs of the surrounding community based on the criteria for mini (less than one acre, appropriate for all areas), neighborhood (1-15 acres, appropriate for medium- and high-density residential areas serving individual neighborhoods), and community (over 15 acres, appropriate for medium- and high-density residential areas serving the City as a whole) parks.
5.9.3-P3	Maintain a City-wide average three minute response time for 90 percent of police emergency service calls.
5.9.3-P4	Maintain a City-wide average three minute response time for fire emergency service calls.
5.9.1-P5	Encourage public visibility for all parks, trails and open spaces.
5.9.1-P14	Encourage publicly accessible open space in new development.
5.9.1-P15	Provide opportunities for private maintenance of publicly accessible open space and trails.
5.9.1-P17	Foster site design for new development so that building height and massing do not overshadow new parks and plazas.
5.9.1-P18	Promote open space and recreational facilities in large-scale developments in order to meet a portion of the demand for parks generated by new development.
5.9.1-P20	Promote the continuation of parks per population ratio of 2.4 per 1,000 residents and explore the potential to increase the ratio to 3.0, based on the Parks and Recreation Needs Assessment (Parks Master Plan), referenced in Plan Prerequisite 5.1.1-P24.

Countywide Trails Master Plan

The Santa Clara County Trails Master Plan Update is a regional trails plan approved by the Santa Clara County Board of Supervisors. It provides a framework for implementing the County's vision of providing a contiguous trail network that connects cities to one another, cities to the county's regional open space resources, County parks to other County parks, and the northern and southern urbanized regions of the County. The plan identifies regional trail routes, sub-regional trail routes, connector trail routes, and historic trails.

City of Santa Clara City Code Chapter 17.35

On July 15, 2014, the Santa Clara City Council adopted Ordinance Number 1928 adding Chapter 17.35 ("Park and Recreational Land") to Title 17 ("Development") of the SCCC. New residential developments are required to provide adequate park and recreational facilities and/or pay a fee in-lieu

of parkland dedication at the discretion of the City, pursuant to the Quimby Act and/or Mitigation Fee Act, to mitigate the impacts of the new residential demand. For subdivisions of 50 units or less, the City may accept a fee in-lieu of the parkland dedication requirement.

The purpose of SCCC Chapter 17.35 is to help mitigate the impacts of new housing development growth on existing parkland and recreational facilities subject to the provisions of the State of California Quimby Act (Quimby) and/or the California Mitigation Fee Act (MFA). Chapter 17.35 requires new residential developments to provide developed park and recreational land and/or pay a fee in lieu of parkland dedication, at the discretion of the City. The City is meeting the parkland dedication standard of three acres per 1,000 residents per the Quimby provisions of the SCCC and 2.6 acres per 1,000 residents per the MFA provisions of the SCCC with regard to neighborhood parks.

4.15.1.2 *Existing Conditions*

Fire Service

Fire protection services for the project site are provided by the City of Santa Clara Fire Department (SCFD). The SCFD consists of 10 stations (Station 10 is temporarily closed and being relocated) distributed throughout the City. The Fire Department responds with highly trained and equipped personnel to emergency scenes, maintaining a City-wide response time of less than 5:30 minutes to 90% of all high-level emergency calls. Response time is measured from time of dispatch to the time of arrival at the call. The closest fire station to the project site is Station 1, located at 777 Benton Street, approximately 0.45 miles northwest of the project site.

Police Service

Police protection services are provided by the City of Santa Clara Police Department (SCPD). Police headquarters are located at 601 El Camino Real, approximately 0.47 miles northeast of the project site.

Schools

The project site is located within the Santa Clara Unified School District (SCUSD). The nearest public schools to the project site are Washington Open Elementary School, located at 270 Washington Street (approximately 0.28 miles southwest of the site), Buchser Middle School, located at 1111 Bellomy Street (approximately 0.26 miles west of the site), and Wilson High School, located at 1840 Benton Street (approximately 0.9 miles northwest of the site).

Parks

The Santa Clara Parks and Recreation Department (Department) provides parks and recreational services in the City. The department is responsible for maintaining and programming the various parks and recreation facilities and works cooperatively with public agencies in coordinating all recreational activities within the City. Overall, as of July 2022, the Department maintains and operates Central Park, a 45.04-acre community park (45.04 acres improved and Central Park North 34.93 acres unimproved, resulting in 79.97 acres), 30 neighborhood parks (121.26 acres improved and 9.39 acres unimproved resulting in 130.65 acres), 13 mini parks (2.69 acres improved and 3.189

acres unimproved resulting in 5.88 acres), public open space (16.32 acres improved and 40.08 acres unimproved resulting in 56.40 acres), recreational facilities (23.90 acres improved and excluding the BMX track), recreational trails (7.59 acres improved and 0.20 acres unimproved resulting in 7.79 acres), and joint use facilities (48.59 acres) throughout the City totaling approximately 265.39 improved acres and 87.79 unimproved acres. Community parks are over fifteen acres, neighborhood parks are one to fifteen acres and mini parks are typically less than one acre in size.

SCCC Chapter 17.35 requires new residential developments to provide developed park and recreational land and/or pay a fee in-lieu of parkland dedication, at the discretion, of the City, and pursuant to the State of California Quimby Act (Quimby) and/or the Mitigation Fee Act (MFA) to help mitigate the impacts of the new resident demand on existing parkland and recreational facilities. The City is meeting the standard of three acres per 1,000 residents per the Quimby provisions of the SCCC and 2.60 acres per 1,000 residents per the MFA provisions of the SCCC with regard to neighborhood parks.

The nearest public parks and mini parks to the project site are Elmer Johnson Field, Townsend Field, War Memorial Park and the Washington Park, all of which are located at 295 Monroe Street (approximately 0.35 miles southwest of the site). These are more than a 10-minute walk from the project site.

Libraries

The City of Santa Clara is served by the Central Park Library located at 2635 Homestead Road, the Mission Library Family Reading Center located at 1098 Lexington Street, and the Northside Branch Library located at 695 Moreland Way. The nearest library is Mission Library Family Reading Center approximately 0.37 miles away at 1098 Lexington Street.

4.15.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
1) Fire Protection?	☐	☐	☒	☐
2) Police Protection?	☐	☐	☒	☐
3) Schools?	☐	☐	☒	☐
4) Parks?	☐	☐	☒	☐
5) Other Public Facilities?	☐	☐	☒	☐

Impact PS-1:	**The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection services. (Less than Significant Impact)**

The certified General Plan EIR concluded that the existing fire station facilities have capacity to absorb additional fire personnel without the need to expand or construct new facilities.[57] The General Plan Amendment proposed by the project would facilitate the expansion of housing on the project site beyond that planned for in the General Plan. As described above in Population and Housing section, the proposed project would result in a net increase of approximately 102 residents compared to existing conditions, and an increase of 65 residents over the maximum residential development assumed for the site in the General Plan. This would represent an incremental increase in the demand for fire protection services.

The project site is within the service area of SCFD and while the project would result in a higher residential density than previously assumed, the additional 65 residents could be served by existing facilities without requiring the construction of new or altered facilities because any additional staffing required for the increase in population could be accommodated within the existing fire facilities.[58] In addition, the proposed project would be constructed in accordance with current fire codes, including those specifying emergency vehicle access and reduction of fire hazards and would pay fees for the expansion of fire services. Therefore, the proposed development project would result in a less than significant impact on fire protection services.

Impact PS-2:	**The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police protection services. (Less than Significant Impact)**

As described in Impact PS-1, the project would result in a minimal population increase and resultant increase in demand for public services, including police protection. The General Plan FEIR concluded that, if additional police officers are needed, they could be housed in the existing facilities. The proposed development project would result in a General Plan Amendment which would facilitate the expansion of housing on-site, and add 65 residents above the General Plan projection. Although the proposed project would result increase the population beyond the level analyzed in the General Plan FEIR, the General Plan concluded that existing facilities have capacity for expansion of staff and resources without the need for new facilities. There would be no need for the construction of new

[57] City of Santa Clara. *2010-2035 General Plan Integrated Final Environmental Impact Report. SCH# 2008092005*. January 2011. Pages 206 to 207.
[58] City of Santa Clara. 2010-2035 General Plan Integrated Final Environmental Impact Report. SCH# 2008092005. January 2011. Pages 209.

or expanded facilities.[59] The project would be adequately served by existing police protection facilities. Therefore, the proposed development project would result in a less than significant impact on police protection services.

Impact PS-3:	**The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for schools. (Less than Significant Impact)**

The project site is located within the service area of the SCUSD. The General Plan FEIR concluded that the planned increase in City residents will eventually require the construction of additional school facilities.[60] However, the SCUSD currently has four closed school sites that could be employed to serve students generated by new residential development.[61]

A net increase of three residential units at the project site over General Plan assumptions would result in approximately one student who would attend local schools.[62] The total number of students generated by the project is estimated to be approximately 19 students. The addition of 19 students would be incremental and would not result in a substantial adverse impact on school facilities, nor would it require the construction of new facilities. In addition, the proposed development project would be required to pay school impact fees consistent with AB1600.

Impact PS-4:	**The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for parks. (Less than Significant Impact)**

. The proposed project will contribute to an increase in demand for parkland. The increased population associated with the proposed project would contribute to increased use of existing parks near the project site. Increased use of local parks could potentially lead to physical deterioration of park facilities. The proposed project would not dedicate any public parkland and will be required to pay a fee in-lieu for parkland dedication to help offset the impacts of the new resident demand on existing parkland and recreational facilities. Therefore, the proposed development project would result in a less than significant impact.

[59] City of Santa Clara. *2010-2035 General Plan Integrated Final Environmental Impact Report. SCH# 2008092005.* January 2011. Page 207.
[60] City of Santa Clara. 2010-2035 General Plan. December 2014.
[61] City of Santa Clara. 2010-2035 General Plan Integrated FEIR. January 2011. Page 208
[62] 0.5 students per household for apartment units: 0.5 x 39 units = ~ 19 students
Enrollment projection consultants. Projected Enrollments January 17, 2020. Page 16.

Impact PS-5:	**The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for other public facilities. (Less than Significant Impact)**

The addition of approximately 102 residents on-site (65 residents more than what was assumed in the General Plan) would result in an incremental increase in demand for public library facilities. The increase would not, however, result in substantial adverse impacts to existing library, or other, facilities, and would not require the construction of new facilities. The addition of up to 65 additional residents in the City beyond the existing General Plan designation would not cause the City to fall below their service goals for library services. If, however, a new library is required in the future, that development would require its own environmental analysis which would determine the impacts of the construction of the facilities.

4.16 RECREATION

4.16.1 Environmental Setting

4.16.1.1 *Regulatory Framework*

State

Government Code Section 66477

The Quimby Act (included within Government Code Section 66477) requires local governments to set aside parkland and open space for recreational purposes. It provides provisions for the dedication of parkland and/or payment of fees in lieu of parkland dedication to help mitigate the impacts from new residential developments. The Quimby Act authorizes local governments to establish ordinances requiring developers of new residential subdivisions to dedicate parks, pay a fee in lieu of parkland dedication, or perform a combination of the two.

Mitigation Fee Act.

In 1989, the State Legislature passed Assembly Bill 1600 (AB1600), adding Section 66000 et seq. to the California Government Code (the "Mitigation Fee Act"), which sets forth requirements for local agencies to follow if they collect fees from developers to defray the cost of the construction of public facilities related to development projects. These legal requirements are frequently referred to as "AB 1600 requirements." Each local agency imposing such development impact fees must prepare an annual report providing specific information about these fees (i.e., a "nexus study") that shows the proper connection of the fees to the project and how accounting and reporting for the fees collected are regulated.

Local

City of Santa Clara 2010 – 2035 General Plan

The City of Santa Clara 2010-2035 General Plan includes policies and programs to provide public services throughout the City. Applicable General Plan policies include, but are not limited to, the following listed below.

Policies	Description
5.1.1-P20	Prior to 2023, identify the location for new parkland and/or recreational facilities to serve employment centers and pursue funding to develop these facilities by 2035.
5.9.1-P2	Develop new parks to serve the needs of the surrounding community based on the criteria for mini (less than one acre, appropriate for all areas), neighborhood (1-15 acres, appropriate for medium- and high-density residential areas serving individual neighborhoods), and community (over 15 acres, appropriate for medium- and high-density residential areas serving the City as a whole) parks.
5.9.1-P5	Encourage public visibility for all parks, trails and open spaces.
5.9.1-P14	Encourage publicly accessible open space in new development.
5.9.1-P15	Provide opportunities for private maintenance of publicly accessible open space and trails.
5.9.1-P17	Foster site design for new development so that building height and massing do not overshadow new parks and plazas.

5.9.1-P18	Promote open space and recreational facilities in large-scale developments in order to meet a portion of the demand for parks generated by new development.
5.9.1-P20	Promote the continuation of parks per population ratio of 2.4 per 1,000 residents and explore the potential to increase the ratio to 3.0, based on the Parks and Recreation Needs Assessment (Parks Master Plan), referenced in Plan Prerequisite 5.1.1-P24.

City of Santa Clara City Code Chapter 17.35

The purpose of SCCC Chapter 17.35 is to help mitigate the impacts of new housing development growth on existing parkland and recreational facilities subject to the provisions of the State of California Quimby Act (Quimby) and/or the California Mitigation Fee Act (MFA). Chapter 17.35 requires new residential developments to provide developed park and recreational land and/or pay a fee in lieu of parkland dedication, at the discretion of the City. The City is meeting the parkland dedication standard of 3.0 acres per 1,000 residents per the Quimby provisions of the SCCC and 2.6 acres per 1,000 residents per the MFA provisions of the SCCC for neighborhood parks.

4.16.1.2 *Existing Conditions*

The Santa Clara Parks and Recreation Department (Department) provides parks and recreational services in the City. The department is responsible for maintaining and programming the various parks and recreation facilities and works cooperatively with public agencies in coordinating all recreational activities within the City. Overall, as of December 2022, the Department maintains and operates Central Park, a 45.04-acre community park (45.04 acres improved and Central Park North 34.93 acres unimproved, resulting in 79.97 acres), 30 neighborhood parks (121.26 acres improved and 9.39 acres unimproved resulting in 130.65 acres), 13 mini parks (2.69 acres improved and 3.19 acres unimproved resulting in 5.88 acres), public open space (16.32 acres improved and 40.08 acres unimproved resulting in 56.40 acres), recreational facilities (23.90 acres improved and excluding the BMX track), recreational trails (7.59 acres improved and 0.20 acres unimproved resulting in 7.79 acres), and joint use facilities (48.59 acres) throughout the City totaling approximately 265.39 improved acres and 87.788 unimproved acres. Community parks are over fifteen acres, neighborhood parks are one to fifteen acres and mini parks are typically less than one acre in size.

The nearest public parks and mini parks to the project site are Elmer Johnson Field, Townsend Field, War Memorial Park and the Washington Park, located at 295 Monroe Street (approximately 0.35 miles southwest of the site). These are more than a 10-minute walk from the project site.

4.16.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Impact REC-1: The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (Less than Significant Impact)

The proposed project would construct 39 apartments, which would generate additional residents who would increase the demand on parks..[63] The proposed project would contribute to an increase in demand for parkland and recreational facilities. The increased use of existing parks and recreational facilities near the project site could potentially lead to physical deterioration of park facilities. The proposed project would not dedicate any public parkland and will be required to pay a fee in-lieu of parkland dedication to help offset the impacts of the new resident demand on existing parkland and recreational facilities. Therefore, the proposed development project would result in a less than significant impact.

Impact REC-2: The project does not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. (No Impact)

The proposed project does not include the construction or expansion of parks or recreation facilities. and will be required to pay a fee in-lieu of parkland dedication to help offset the impacts of the new resident demand on existing parkland and recreational facilities. Therefore, the proposed project would not result in adverse physical effects on the environment through the expansion of parks or recreation facilities.

[63] For purposes of the City's parkland dedication requirements, the City relies upon census data to calculate the number of persons per household. For this calculation, the project will generate an estimated 94 residents (2.4 persons/household x 39 units). Based on the MFA standard of 2.6 acres / 1000 residents, the amount of public parkland required for the project is approximately 0.24 acres.

4.17 TRANSPORTATION

The information in this section is based in part on the Transportation Analysis prepared by Hexagon Transportation Consultants on August 23, 2022. This study is included as Appendix F of this document.

4.17.1 Environmental Setting

4.17.1.1 *Regulatory Framework*

State

Regional Transportation Plan

MTC is the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area, including Santa Clara County. MTC is charged with regularly updating the Regional Transportation Plan, a comprehensive blueprint for the development of mass transit, highway, airport, seaport, railroad, bicycle, and pedestrian facilities in the region. MTC and ABAG adopted Plan Bay Area 2050 in October 2022, which includes a Regional Transportation Plan to guide regional transportation investment for revenues from federal, state, regional and local sources through 2050.

Senate Bill 743

SB 743 establishes criteria for determining the significance of transportation impacts using a vehicle miles traveled (VMT) metric intended to promote the reduction of GHG emissions, the development of multimodal transportation networks, and a diversity of land uses. Specifically, SB 743 requires analysis of VMT in determining the significance of transportation impacts. Local jurisdictions were required by Governor's Office of Planning and Research (OPR) to implement a VMT policy by July 1, 2020.

SB 743 did not authorize OPR to set specific VMT impact thresholds, but it did direct OPR to develop guidelines for jurisdictions to utilize. CEQA Guidelines Section 15064.3(b)(1) describes factors that might indicate whether a development project's VMT may be significant. Notably, projects located within 0.50 mile of transit should be considered to have a less than significant transportation impact based on OPR guidance.

Regional and Local

Congestion Management Program

Valley Transportation Authority (VTA) oversees the Congestion Management Program (CMP), which is aimed at reducing regional traffic congestion. The relevant state legislation requires that urbanized counties in California prepare a CMP in order to obtain each county's share of gas tax revenues. State legislation requires that each CMP define traffic LOS standards, transit service standards, a trip reduction and transportation demand management plan, a land use impact analysis program, and a capital improvement element. VTA has review responsibility for proposed development projects that are expected to affect CMP-designated intersections.

Climate Action Plan Transportation Demand Management

The City will require all new developments greater than 25 housing units or more than 10,000 nonresidential square feet to draft and implement a VMT reduction strategy that reduces drive-alone trips. The degree to which each project implements a Transportation Demand Management (TDM) program as part of the VMT reduction strategy will be based on the location and land use of the proposed project. The VMT reductions may be achieved through project design characteristics, land use, parking, access, or TDM best practices.

City of Santa Clara VMT Policy

The Santa Clara City Council adopted a VMT policy in compliance with SB 743 on June 23, 2020. The policy sets thresholds of significance for various land uses, using the countywide average VMT as the environmental baseline. To determine whether a project will have a significant transportation impact, project VMT is compared to the appropriate threshold. For residential land uses, the adopted threshold is 15 percent below the existing countywide VMT per capita. For employment uses, the adopted threshold is 15 percent below the existing countywide VMT per employee. For retail uses, the threshold is the existing countywide VMT for retail uses.

In addition to establishing the environmental baseline and thresholds of significance, the VMT policy establishes screening criteria for certain projects that are presumed to have a less than significant VMT impact. Projects which meet the screening criteria would not be required to quantify VMT and compare it to the City's adopted threshold. Projects which generate less than 110 daily vehicle trips or less would be screened out from a quantitative VMT analysis and would be presumed to have a less than significant VMT impact. Retail land uses providing 50,000 square feet or less would be presumed to be less than significant. Transit supportive projects which are located within VTA-mile of an existing major transit stop or an existing transit stop along a High Quality Transit Corridor[64] would also be presumed to be less than significant, provided that a minimum density of 35 units/acre is met for residential projects, a minimum FAR of 0.75 is met for office/R&D projects, no excess parking is provided, and no affordable dwelling units are replaced.

All proposed projects are required to undergo environmental review as part of the approval process. This includes an analysis of CEQA impacts (VMT) and non CEQA operational measures of intersection efficiency level of service (LOS). The City's VMT policy also establishes LOS as an operational measure of intersection efficiency, which is not defined as a transportation environmental impact per CEQA.

City of Santa Clara Bicycle Plan

The City of Santa Clara Final Bicycle Plan Update (2018) provides a bikeway planning and design tool, which contains the policy vision, design guidance, and specific recommendations to guide public and private investments in active transportation bicycle facilities and related programs.

City of Santa Clara Pedestrian Master Plan

[64] A high quality transit corridor is a corridor with fixed route bus service with service intervals that do not exceed 15 minutes during peak commute hours.

The Pedestrian Master Plan, approved February 25, 2020, is a forward-looking plan to capture the benefits of walking as the City anticipates growth and redevelopment. The plan establishes methods for safe, comfortable, convenient, active, and implementable goals to improve walkability and establish zones for improved pedestrian development.

4.17.1.2 *Existing Conditions*

The proposed project is located at the intersection of The Alameda and Park Avenue. Regional access to the project site is provided through Interstate 880 and Highway 101 which are south and northeast of the project site respectively. These regional roadways connect to The Alameda, El Camino Real, and Winchester Boulevard which provide access to local streets around the project site. The existing site is accessible via driveways located on Park Avenue and The Alameda.

Bicycle Facilities

There are bike lanes on The Alameda south of Park Avenue/Bellomy Street and on all of Park Avenue that connect cyclists from the project site to the surrounding areas. According to the Santa Clara Bicycle Master Plan Update 2018, Class IV separated bikeways are planned on El Camino Real, Class II bike lanes are planned on Bellomy Street from Park Avenue westward to connect to the existing bike lanes west of Washington Street, and a Class III bike route is planned on Market Street from The Alameda westward to connect to the existing bike lanes west of Lafayette Street.

Pedestrian Facilities

Pedestrian facilities in the project area consist of sidewalks and crosswalks. A continuous network of sidewalks is present along all of the surrounding streets. Crosswalks with pedestrian signals are located at all of the intersections in the area. At the Park Avenue/The Alameda intersection, crosswalks are available on the west and south legs of the intersection. There is also a midblock crossing on The Alameda at the Safeway driveway south of the site. Further, there are pedestrian crossings present on Park Avenue at unsignalized intersections in the project vicinity.

Transit Services

The VTA Frequent Route 22, which has a headway of 15 minutes during morning and evening peaks, runs along the El Camino Real/The Alameda corridor with the nearest bus stop approximately 1,400 feet from the site. Route 22 also stops at the Santa Clara Caltrain Station, which is approximately 0.6 mile from the project site and provides connections to heavy rail service, such as Altamont Corridor Express, Caltrain, Capitol Corridor.

4.17.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle lanes, and pedestrian facilities?	☐	☐	☒	☐
2) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	☐	☐	☒	☐
3) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
4) Result in inadequate emergency access?	☐	☐	☐	☒

Impact TRN-1: The project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle lanes, and pedestrian facilities. (Less than Significant Impact)

Transit Facilities

The proposed development project would increase the population on-site by approximately 102 people. This could increase the use of public transportation in the surrounding area. The additional transit users would not interfere with the normal operations of transit services and would not exceed the capacity of the existing transit operations. Therefore, the proposed development project would have a less than significant impact on transit services.

Roadways

The proposed project would contribute vehicle trips to the roadway network surrounding the project. The City of Santa Clara determined that, based on the trip generation rate of the proposed project, there would not be operational issues associated with these new trips. Additionally, the proposed project would not alter the roadway circulation network. Therefore, the proposed project would result in less than significant impacts on roadway operations.

Pedestrian Facilities

The proposed project would improve the sidewalks along the project frontages by planting trees in sidewalk wells and providing landscaping along the building frontages. According to the transportation assessment prepared by Hexagon Transportation Consultants, the existing curb ramps at the Park Avenue/The Alameda intersection along the project frontage do not include truncated domes, and the ramp slopes do not appear to meet the current Americans with Disabilities Act (ADA) requirement. However, during a site visit to the site conducted in late August, these ramps had been improved and included the ADA required features. The sidewalks and ADA curb ramps

would facilitate pedestrian movements between the project site and surrounding points of interest, such as bus stops. Therefore, the proposed project would not conflict with a program, plan, ordinance, or policy controlling pedestrian facilities.

Bicycle Facilities

The proposed development project would not remove existing bicycle facilities and would not interfere with existing plans, policies, or ordinances corresponding to bicycle facilities. The proposed project would provide secure bicycle storage in a bike room on the ground floor of the building with access from The Alameda and bike racks near the entrance to the retail space on Park Avenue. Therefore, the proposed project would enhance bicycle infrastructure on the project site and would not impact existing or planned bicycle facilities, such as local bike lanes.

Impact TRN-2: The project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b). (Less than Significant Impact)

The OPR and City of Santa Clara VMT guidelines state that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) located within 0.5 miles of an existing major transit stop or an existing stop along a high-quality transit corridor would have a less than significant impact on VMT. A high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

The proposed project is located in a transit proximity area because it is located within a half mile of the El Camino Real transit corridor, which is considered a high-quality transit corridor. Additionally, the VTA Frequent Route 22 runs along El Camino Real with the nearest bus stop approximately 0.26 miles from the site and a frequency of 15 minutes during the morning and evening peaks. Route 22 also stops at the Santa Clara Caltrain Station, which is approximately 0.6 miles from the project site.

The proposed project would construct 39 residential units on the 0.4-acre site, which calculates to a density of 98 units per acre, exceeding the minimum density requirement. The City of Santa Clara Zoning Code (Section 18.22.260) states that residential units in mixed-use zoning districts are required to provide one parking space for each studio and one bedroom unit; one and one-half spaces for each two-plus bedroom unit, and three spaces per 1,000 square feet for retail. Based on these ratios the proposed project would be required to provide 51 parking spaces (49 for residential and five for retail). The proposed project would include 33 vehicle parking spaces with 30 used for the residential component and three for the retail. Therefore, the project would provide 30 percent fewer spaces than are required in the mixed-use zoning district.

Therefore, based on the density, proximity, and parking ratio of the proposed project, the proposed project would be consistent with the requirements for a low VMT, transit-oriented development project under OPR and City of Santa Clara VMT guidelines. Therefore, the proposed development project would result in a less than significant VMT impact.

Impact TRN-3:	**The project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). (Less than Significant Impact)**

The proposed development project would not alter the geometric design of the roadways surrounding the project and would not substantially change circulation of vehicles on the project site. Additionally, the proposed project would comply with design requirements as prescribed by the City of Santa Clara. Therefore, the proposed project would not substantially increase hazards due to geometric design features on-site and would not introduce incompatible uses.

Impact TRN-4:	**The project would not result in inadequate emergency access. (No Impact)**

The proposed development project would comply with the regulations of the City of Santa Clara emergency services and would ensure emergency access to the project site. The Alameda and Park Avenue would provide emergency vehicle access to all sides of the project building. Therefore, the proposed development project would provide adequate emergency access to the site and would have no impacts.

4.17.3 Non-CEQA Effects

While the evaluation of project CEQA impacts on the transportation system is based on VMT, in accordance with the City of Santa Clara Transportation Policy (Resolution No. 20-8861), the following discussion is included for informational purposes because the City of Santa Clara requires parking to be provided in quantities sufficient for the development.

Parking

The proposed development project would provide three parking spaces for the retail land uses and 30 parking spaces for the residential units. Parking for the residential units would be provided in the underground parking garage below the building. The proposed project would result in a greater than 25 percent reduction in parking, compared to the 51 parking spaces required in the Zoning Code. Therefore, the proposed project would require a variance in compliance with Zoning Code Section 18.90.020.

4.18 TRIBAL CULTURAL RESOURCES

4.18.1 Environmental Setting

4.18.1.1 *Regulatory Framework*

State

Assembly Bill 52

AB 52, effective July 2015, established a new category of resources for consideration by public agencies called Tribal Cultural Resources (TCRs). AB 52 requires lead agencies to provide notice of projects to tribes that are traditionally and culturally affiliated with the geographic area if they have requested to be notified. Where a project may have a significant impact on a tribal cultural resource, consultation is required until the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource or until it is concluded that mutual agreement cannot be reached.

Under AB 52, TCRs are defined as follows:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are also either:
    - Included or determined to be eligible for inclusion in the California Register of Historic Resources, or
    - Included in a local register of historical resources as defined in Public Resources Code Section 5020.1(k).

A resource determined by the lead agency to be a TCR.

4.18.1.2 *Existing Conditions*

According to the City of Santa Clara General Plan, all parts of the City have the potential to contain subsurface archeological resources including tribal burial grounds.[65] The Tamien Nation has requested notification of projects in the City of Santa Clara under AB 52.

4.18.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				

[65] City of Santa Clara. General Plan 2010-2035 Integrated EIR. Page 327. January 2011

1) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?	☐	☒	☐	☐
2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Impact TCR-1: As mitigated, the project would not cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k). (Less than Significant Impact with Mitigation Incorporated)

The project site does not contain any known tribal cultural resources listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k). Additionally, a request for tribal consultation was conducted for the project on August 31st, 2022. None of the tribes contacted requested further consultation or mitigation. The project would not cause substantial adverse change in the significance of tribal cultural resources listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k). Additionally, the proposed project would implement the measures identified in Section 4.5 Cultural Resources in the event that Native American resources are discovered. Therefore, the proposed project would result in a less than significant impact with mitigation incorporated.

Impact TCR-2: The project would not cause a substantial adverse change in the significance of a tribal cultural resource that is determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. (Less than Significant Impact with Mitigation Incorporated)

The City of Santa Clara has not identified tribal cultural resources on the project site; therefore, the proposed project would not cause substantial adverse change in the significance of a tribal cultural resource as determined by the City. As stated above, if the proposed project encountered tribal resources the measures identified in Section 4.5 would be implemented to reduce impacts to a less than significant impact.

4.19 UTILITIES AND SERVICE SYSTEMS

4.19.1 Environmental Setting

4.19.1.1 *Regulatory Framework*

State

State Water Code

Pursuant to the State Water Code, water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (approximately 980 million gallons) of water annually must prepare and adopt an urban water management plan (UWMP) and update it every five years. As part of a UWMP, water agencies are required to evaluate and describe their water resource supplies and projected needs over a 20-year planning horizon, water conservation, water service reliability, water recycling, opportunities for water transfers, and contingency plans for drought events. The City of Santa Clara adopted its most recent UWMP in June 2021.

Assembly Bill 939

The California Integrated Waste Management Act of 1989, or AB 939, established the Integrated Waste Management Board, required the implementation of integrated waste management plans, and mandated that local jurisdictions divert at least 50 percent of solid waste generated (from 1990 levels), beginning January 1, 2000, and divert at least 75 percent by 2010. Projects that would have an adverse effect on waste diversion goals are required to include waste diversion mitigation measures.

Assembly Bill 341

AB 341 sets forth the requirements of the statewide mandatory commercial recycling program. Businesses that generate four or more cubic yards of garbage per week and multi-family dwellings with five or more units in California are required to recycle.

Senate Bill 1383

SB 1383 establishes targets to achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025. The bill grants CalRecycle the regulatory authority required to achieve the organic waste disposal reduction targets and establishes an additional target that at least 20 percent of currently disposed edible food is recovered for human consumption by 2025.

California Green Building Standards Code

The California Green Building Standards Code (CALGREEN) establishes mandatory green building standards for all buildings in California. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resources efficiency, and indoor environmental quality. These standards include the following mandatory set of measures, as well as more rigorous voluntary guidelines, for new construction projects to achieve specific green building performance levels:

- Reducing indoor water use by 20 percent;
- Reducing wastewater by 20 percent;
- Recycling and/or salvaging 50 percent of nonhazardous construction and demolition debris; and
- Providing readily accessible areas for recycling by occupants.

Local

Santa Clara General Plan

General Plan Policies applicable to utilities and service systems that are relevant to the project include the following:

Policies	Description
5.10.1-P6	Require adequate wastewater treatment and sewer conveyance capacity for all new development.
5.3.1-P9	Require that new development provide adequate public services and facilities, infrastructure, and amenities to serve the new employment or residential growth.
5.3.1-P27	Encourage screening of above-ground utility equipment to minimize visual impacts.
5.3.1-P28	Encourage undergrounding of new utility lines and utility equipment throughout the City.
5.10.5-P21	Require that storm drain infrastructure is adequate to serve all new development and is in place prior to occupancy.

4.19.1.2 *Existing Conditions*

Water Supply

The City of Santa Clara has four sources of water. These sources include two treated water sources from Valley Water and the San Francisco Public Utilities Commission, groundwater pumped from the Santa Clara sub-basin through the City's owned and operated groundwater wells, and recycled water purchased from South Bay Water Recycling.[66] In 2020, the City's water demand was approximately 18,302 acre feet (approximately 16.3 million gallons per day) for potable water and 3,499 acre feet (3.1 million gallons per day) for recycled water.[67] Recycled water lines are located southwest of the project site on parking area near the War Memorial Playground adjacent to Monroe Street.

The water system consists of approximately 335 miles of water mains, 26 active water wells and seven storage tanks with 28.8 million gallons of water storage capacity.[68]

[66] South Bay Recycled Water provides advanced tertiary treated water from the RWF. The City's recycled water program delivers recycled water throughout the City for landscaping, parks, public services and businesses.
[67] City of Santa Clara. 2020 Urban Water Management Plan, City of Santa Clara Water Utility. Adopted June 22, 2021.
[68] City of Santa Clara. 2020 Urban Water Management Plan, City of Santa Clara Water Utility. Adopted June 22, 2021.

The vacant project site does not currently have any water consumption.

Wastewater Services

Sanitary Sewer lines that serve the site are maintained by the City of Santa Clara Sewer Utility. Wastewater from the City of Santa Clara is treated at the Regional Wastewater Facility (RWF), which is owned jointly by the Cities of San José and Santa Clara and is operated by the City of San José's Department of Environmental Services. The facility is one of the largest advanced wastewater treatment facilities in California and serves over 1,400,000 people in San José, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Saratoga and Monte Sereno.[69] The RWF provides primary, secondary, and tertiary treatment of wastewater and has the capacity to treat 167 million gallons of wastewater a day.

Approximately 10 percent of the facility's effluent is recycled for non-potable uses and the remainder flows into San Francisco Bay. The NPDES permit for the RWF includes wastewater discharge requirements. The project site does not generate wastewater under existing conditions.

Stormwater Drainage

The City of Santa Clara owns and maintains the municipal storm drainage system which serves the project site. Existing storm drain lines are located within Park Avenue and The Alameda, adjacent to the project site. The project site is 100 percent pervious.

Solid Waste

Solid waste collection in the City of Santa Clara is provided by Mission Trail Waste System and is disposed of at Newby Island Landfill through a contract with the City. As of December 2019, Newby Island Landfill has a disposal capacity of 14.6 million cubic yards of remaining capacity.[70] Recycling services are provided through Stevens Creek Disposal and Recycling. The site currently does not generate solid waste.

4.19.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
1) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐

[69] City of San Jose. San Jose-Santa Clara Regional Wastewater Facility. Accessed October 18, 2022. https://www.sanjoseca.gov/your-government/environment/water-utilities/regional-wastewater-facility
[70] North, Daniel. General Manager, Republic Services. Personal communications. November 14, 2019.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
2) Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
3) Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
4) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
5) Be noncompliant with federal, state, or local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

Impact UTL-1: The project would not require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. (Less than Significant Impact)

Based on a sewer design analysis conducted for the project, the proposed project would connect to existing utilities located in the streets around the project site which would have a capacity to serve the proposed project. The proposed project also includes a General Plan Amendment which would result in an increase of 25 residential units over the existing General Plan designation. The proposed project would increase of the expected population on the site by approximately 65 residents. This increase would only marginally increase the demand on utilities for the site; therefore, the proposed project would not require the expansion of utility facilities or relocation of existing facilities.

Water

It is estimated that each of the residential units on the project site would use approximately 151 gallons per day (equal to 5,889 gallons of water per day for the entire development) and the commercial unit would use 1,805 gallons per day[71]. Additionally, the proposed development project

[71] Bay Area Water Supply and Conservation Agency. Per Capita Water Use. https://bawsca.org/water/use/percapita Accessed August 28, 2020.
2.61 persons per residence x 57.8 gallons per capita per day = 151 gallons per day per residence x 39 residences = 5,889 gallons per day.
Bay Area Water Supply and Conservation Agency. Projected Water Usage for BAWSCA Member Agencies: Water Use Breakdown for the City of Santa Clara. 2006.
1 commercial spaces x 1,805 gallons per day per account = 1,805 gallons per day

includes a General Plan Amendment which would result in the expansion of development capacity which would expand water use. This is accounted for in the calculation of the total water use for the proposed project. The project would utilize existing water lines in Park Avenue and The Alameda and would not require expansion or relocation of City water facilities or installation of new water lines because the proposed project would only marginally increase the total water demand of the City compared to the projected growth identified in the Urban Water Management Plan.[72] Thus, the proposed development project would have a less than significant impact.

Wastewater

The proposed development project would generate an estimated 6,540 gallons of wastewater per day.[73] This is less than one tenth of one percent of the City's total allocation of treatment capacity.[74] The proposed development project would not increase the need for wastewater treatment beyond the capacity of the RWF which has capacity for future population growth. Therefore, the project would have a less than significant impact on the need for new wastewater facilities.

The project would connect to existing sewer lines in Park Avenue and The Alameda, which have adequate capacity to serve the project. Therefore, the project would not require the construction or relocation of new or expanded wastewater lines. The project would have a less than significant impact.

Stormwater Drainage

The project site is currently vacant. Runoff from the project site currently enters the storm drainage system untreated and unimpeded. The project would increase the impervious area on the project site by 17,763 square feet or almost 100 percent compared to the existing impervious area. While the project would increase impervious surfaces on-site, the project would install treatment flow-through planters, sized appropriately for their drainage areas, to decrease the rate and volume of stormwater runoff entering the City's storm drainage system. For these reasons, the project would not exceed the capacity of the existing storm drainage system serving the project site and would not require the construction or relocation of new or expanded storm drains. Therefore, the proposed change in land use would not result in runoff in excess of existing storm drain capacity.

Electric Power and Telecommunication Facilities

The project would utilize existing utility connections to connect to the City's electric and telecommunications systems. Although the project would increase the demand on existing facilities in the City, relocation of existing or construction of new facilities would not be needed to serve the proposed project. As a result, the proposed development project would have a less than significant impact on these facilities.

[72] City of Santa Clara. 2020 Urban Water Management Plan. June 22, 2021.
[73] Wastewater generated by the proposed development project is assumed to be 85 percent of the total water demand.
[74] Based on the City's allocation of treatment capacity of 25 mgd as identified by the Tributary Agencies Estimated Available Plant Capacity – 2020. December 18, 2020. https://www.sanjoseca.gov/Home/ShowDocument?id=68283.

Impact UTL-2:	**The project would not have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years. (Less than Significant Impact)**

As proposed, the project would use approximately 7,694 gallons per day of water. This increase is within the assumed water demand accounted for in the Urban Water Management Plan and would not impact the ability for the City to provide water in future years, including normal, dry, and multiple dry years. Therefore, the proposed project would have a less than significant impact on the City's water supplies.

Impact UTL-3:	**The project would not result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. (Less than Significant Impact)**

As stated above, the proposed project would generate an estimated 6,540 gallons of wastewater per day. This is less than one-half of one percent of the City's total allocation of treatment capacity of 25 million gallons. This increase in wastewater would not impact the ability for the RWF to serve the City of Santa Clara and would fall within the capacity for water treatment of the facility. Therefore, the project would have a less than significant impact on the ability for the wastewater provider's existing commitments.

Impact UTL-4:	**The project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. (Less than Significant Impact)**

Construction

During construction, the project would be required to comply with the City of Santa Clara construction debris diversion ordinance which requires projects over 5,000 square feet to divert 65 percent of construction and demolition debris from landfills. Implementation of this policy would reduce the waste disposal required during the project construction and limit waste accumulation at local landfills.

Operation

The project is estimated to generate approximately 639 pounds of solid waste per day.[75] Santa Clara County's Integrated Waste Management Plan (IWMP) requires each jurisdiction in the County to achieve a landfill diversion requirement of 50 percent per year. The Newby Island Landfill has

[75] Calrecycle. California's 2017 Per Capita Disposal Rate. Accessed October 18, 2022. https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/mostrecent/. 2.61 existing residents per unit x 39 units x 6.2 lbs. per resident per day = 631 lbs. per day https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates. 5 lbs per 1000 sq ft per day x 1540 square feet = 8 lbs per day

remaining capacity of approximately 14.6 million cubic yards, as of December 2019, with a reasonable compaction rate of 1,850 pounds per cubic yard.[76] Closure of the Landfill is expected to occur in 2041.[7778] Therefore, implementation of the proposed development project would not result in a significant increase in solid waste and recyclable materials generated within the City of Santa Clara and would not require that new landfill facilities be contracted with or constructed to serve the proposed development project.

Impact UTL-5:	**The project would not be noncompliant with federal, state, or local management and reduction statutes and regulations related to solid waste. (Less than Significant Impact)**

Consistent with CALGreen requirements, the proposed project would be required to provide on-site recycling facilities, develop a construction waste management plan, salvage at least 65 percent of nonhazardous construction/demolition debris (by weight), and implement other waste reduction measures. Additionally, the estimated increases in solid waste generation from future development would be avoided through implementation of the Santa Clara County Integrated Waste Management Plan. The Integrated Waste Management Plan, in combination with existing regulations and programs, would ensure that the proposed development project would not result in significant impacts on solid waste disposal capacity in excess of state or local standards or in excess of NISL capacity.

[76] North, Daniel. General Manager, Republic Services. Personal communications. November 14, 2019.
[77] North, Daniel. General Manager, Republic Services. Personal communications. November 21, 2019.
[78] After 2041 a new waste disposal location would be required to be conditioned for the City of Santa Clara. This would, however, be after the 2035 General Plan would be drafted and impacts associated with the new landfill needs would be addressed as part of the General Plan update.

4.20 WILDFIRE

4.20.1 Environmental Setting

4.20.1.1 *Regulatory Framework*

State

Fire Hazard Severity Zones

CAL FIRE is required by law to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. Referred to as Fire Hazard Severity Zones (FHSZs), these maps influence how people construct buildings and protect property to reduce risk associated with wildland fires. FHSZs are divided into areas where the state has financial responsibility for wildland fire protection, known as state responsibility areas (SRAs), and areas where local governments have financial responsibility for wildland fire protection, known as local responsibility areas (LRAs). Homeowners living in an SRA are responsible for ensuring that their property is in compliance with California's building and fire codes. Only lands zoned for very high fire hazard are identified within LRAs.

California Fire Code Chapter 47

Chapter 47 of the California Fire Code sets requirements for wildland-urban interface fire areas that increase the ability of buildings to resist the intrusion of flame or burning embers being projected by a vegetation fire, in addition to systematically reducing conflagration losses through the use of performance and prescriptive requirements.

California Public Resources Code Section 4442 through 4431

The California Public Resources Code includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that uses an internal combustion engine; specify requirements for the safe use of gasoline-powered tools on forest-covered land, brush-covered land, or grass-covered land; and specify fire suppression equipment that must be provided on-site for various types of work in fire-prone areas. These regulations include the following:

- Earthmoving and portable equipment with internal combustion engines would be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (Public Resources Code Section 4442);
- Appropriate fire suppression equipment would be maintained during the highest fire danger period, from April 1 to December 1 (Public Resources Code Section4428);
- On days when a burning permit is required, flammable materials would be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor would maintain appropriate fire suppression equipment (Public Resources Code Section 4427); and
- On days when a burning permit is required, portable tools powered by gasoline-fueled internal combustion engines would not be used within 25 feet of any flammable materials (Public Resources Code Section 4431).

California Code of Regulations Title 14

The California Board of Forestry and Fire Protection has adopted regulations, known as SRA Fire Safe Regulations, which apply basic wildland fire protection standards for building, construction, and development occurring in a SRA. The future design and construction of structures, subdivisions and developments in SRAs are required to provide for the basic emergency access and perimeter wildfire protection measures discussed in Title 14.

Fire Management Plans

CAL FIRE has developed an individual Unit Fire Management Plan for each of its 21 units and six contract counties. CAL FIRE has developed a strategic fire management plan for the Santa Clara County Unit, which covers the project area and addresses citizen and firefighter safety, watersheds and water, timber, wildlife and habitat (including rare and endangered species), unique areas (scenic, cultural, and historic), recreation, range, structures, and air quality. The plan includes stakeholder contributions and priorities and identifies strategic areas for pre-fire planning and fuel treatment as defined by the people who live and work with the local fire issues.

4.20.1.2 *Existing Conditions*

The project site is located in an urbanized area in of the City of Santa Clara. This area is not located within a Fire Hazard Severity Zone as designated by Cal Fire's Fire and Resource Assessment Program.[79]

4.20.2 Impact Discussion

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
1) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
2) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
3) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒

[79] California Department of Forestry and Fire Protection. Fire and Resource Assessment Program. Very High Fire Hazard Severity Zones in LRA: As Recommended by Calfire. October 8, 2008.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
4) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

The project site is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones; therefore, the project would not result in wildfire impacts.

4.21 MANDATORY FINDINGS OF SIGNIFICANCE

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1)	Does the project have the potential to substantially degrade the quality of the environment, 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, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
2)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐
3)	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Impact MFS-1: As mitigated, the project does not have the potential to substantially degrade the quality of the environment, 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, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. (Less than Significant Impact with Mitigation Incorporated)

The proposed project would not result in impacts to wildlife resulting from reduction of habitat, impacts to sensitive populations, impacts to plant and animal communities, and reduction in rare or endangered species. Mitigation is included to reduce impacts to raptors and other nesting birds from construction activities. Additionally, the proposed project would implement mitigation measures to reduce impacts to on-site tree removal and would require monitoring on-site for archaeological and historical resources during construction. Further, the proposed project would incorporate mitigation measures CUL 2.1-1, CUL 2.1-2, and CUL 3.1-1 to prevent the disturbance or destruction of archaeological or Native American resources if they are determined to be on site and would follow procedures for cataloging and preserving the resources. Therefore, the proposed project would result in a less than significant impact on these resources.

Impact MFS-2: The project does not have impacts that are individually limited, but cumulatively considerable. (Less than Significant Impact)

Under Section 15065(a)(3) of the CEQA Guidelines, a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has potential environmental effects "that are individually limited, but cumulatively considerable." As defined in Section 15065(a)(3) of the CEQA Guidelines, cumulatively considerable means "that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."

The proposed project would result in temporary air quality, biological, cultural, hazardous and hazardous materials, hydrology and water quality, and noise impacts during construction. With implementation of the identified Standard Permit Conditions, BMPs, mitigation measures, and consistency with adopted City policies, construction impacts would be mitigated to a less than significant level. Because the nature of the identified impacts is temporary and would be mitigated, the proposed project would not have a cumulatively considerable impact on air quality, biological, cultural, hazardous and hazardous materials, and noise impacts.

Cumulative TAC Impacts

A refined analysis of potential health impacts from vehicle traffic on El Camino Real was conducted since the roadway was estimated to have average daily traffic (ADT) exceeding 10,000 vehicles. The refined analysis involved predicting emissions for the traffic volume and mix of vehicle types on the roadway near the project site and using an atmospheric dispersion model to predict exposure to TACs. The project construction combined with nearby sources of TACs would contribute to cumulative health risk impacts. These impacts are summarized below in Table 4.21-1.

Table 4.21-1 Construction TAC Effects

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Construction (Mitigated)	1.83 (infant)	0.01	<0.01
El Camino Real, ADT 23,733	0.04	<0.01	<0.01
Santa Clara University (Facility ID #15397_1, Generator), MEI at 1,000 feet	0.13	<0.01	<0.01
Santa Clara University (Facility ID #15397_10, Generator), MEI at 970 feet	0.17	<0.01	<0.01
Santa Clara University (Facility ID #15397_12, Generator), MEI at 950 feet	1.05	<0.01	<0.01
Santa Clara University (Facility ID #15397_13, Generator), MEI at 980 feet	0.29	<0.01	<0.01
Santa Clara University (Facility ID #15397_14, Generator), MEI at 910 feet	0.10	<0.01	<0.01
Santa Clara University (Facility ID #15397_16, Generator), MEI at 970 feet	0.26	<0.01	<0.01
Santa Clara University (Facility ID #15397_18, Generator),	026	<0.01	<0.01

MEI at 510 feet			
Santa Clara University (Facility ID #15397_19, Generator), MEI at 760 feet	0.11	<0.01	<0.01
Santa Clara University (Facility ID #15397_21, Generator), MEI at 3700 feet	0.21	<0.01	<0.01
Santa Clara University (Facility ID #15397_23, Generator), MEI at 575 feet	0.13	<0.01	<0.01
Cumulative Total	4.58	<0.12	<0.12
BAAQMD Cumulative Source threshold	**100**	**0.8**	**10.0**
Exceed Threshold?	No	No	No

As shown above, the proposed project would not have a cumulatively considerable contribute to an exceedance of TACs when combined with existing sources. Therefore, the proposed project would not result in a significant cumulative TAC impact.

The proposed project is consistent with the 2022 CAP and would not, by itself, result in significant emissions of criteria air pollutants or GHGs. Therefore, the project would not result in a cumulatively considerable impact.

As discussed in the respective sections, the proposed project would have no impact, a less than significant impact, or a less than significant impact with mitigation on aesthetics, agriculture and forestry resources, geology and soils, land use, mineral resources, population and housing, public services, recreation, and utility and service facilities. The project would not have a cumulatively considerable impact on these resource areas.

Impact MFS-3: As mitigated, the project does not have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly. (Less than Significant Impact with Mitigation Incorporated)

Consistent with Section 15065(a)(4) of the CEQA Guidelines, a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has the potential to cause substantial adverse effects on human beings, either directly or indirectly. Under this standard, a change to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to effects on particular individuals. While changes to the environment that could indirectly affect human beings would be represented by all of the designated CEQA issue areas, those that could directly affect human beings include air quality, hazardous materials, and noise. Implementation of applicable regulations and policies, Conditions of Approval, and mitigation measures would reduce the impacts to a less than significant level. No other direct or indirect adverse effects on human beings have been identified.

SECTION 5.0 REFERENCES

The analysis in this Initial Study is based on the professional judgement and expertise of the environmental specialists preparing this document, based upon review of the site, surrounding conditions, site plans, and the following references:

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SECTION 6.0 LEAD AGENCY AND CONSULTANTS

6.1 LEAD AGENCY

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2655 THE ALAMEDA RESIDENTIAL DEVELOPMENT CONSTRUCTION COMMUNITY RISK ASSESSMENT

Santa Clara, California

September 21, 2022

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Introduction

The purpose of this report is to address the potential community risk impacts associated with the construction of a proposed residential development located at 2655 The Alameda in Santa Clara, California. The air quality impacts from this project would be associated with demolition of the existing land uses and construction of the residential building. Air pollutant emissions associated with construction of the project were predicted using appropriate computer models. In addition, the potential health risk impacts from existing toxic air contaminant (TAC) sources affecting the nearby and proposed sensitive receptors were evaluated. The analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Project Description

The project site lies where The Alameda and Park Avenue meet Bellomy Street in Santa Clara, CA. The proposed project would develop the vacant 0.4-acre project site with a four-story mixed-use development including 39 residential units and 1,540 square feet (sf) of retail space. The the site would be provided in one, subgrade parking level with 23 spaces and surface parking with 10 spaces, for a total of 33 parking spaces.

Setting

The project is located in Santa Clara County, which is in the San Francisco Bay Area Air Basin. Ambient air quality standards have been established at both the State and federal level. The Bay Area meets all ambient air quality standards with the exception of ground-level ozone, respirable particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$).

Air Pollutants of Concern

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area'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. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of 10 micrometers or less (PM_{10}) and fine particulate matter where particles have a diameter of 2.5 micrometers or less ($PM_{2.5}$). Elevated concentrations of PM_{10} and $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

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

Toxic Air Contaminants

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality, often because they cause cancer. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about three-quarters of the cancer risk from TACs (based on the Bay Area average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the Federal Hazardous Air Pollutants programs. Health risks from TACs are estimated using the Office of Environmental Health Hazard Assessment (OEHHA) risk assessment guidelines, which were published in February of 2015.[2] See *Attachment 1* for a detailed description of the community risk modeling methodology used in this assessment.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons 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 closest sensitive receptors to the project site are the residents in the single-family homes to the west, the multi-family housing for Santa Clara University to the east, and the Kids On Campus Preschool to the north of the project site. Additional sensitive receptors are located at further distances surrounding the site. This project would introduce new sensitive receptors (i.e., residents) to the area.

Regulatory Setting

Federal Regulations

The United States Environmental Protection Agency (EPA) sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural,

[2] 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.

industrial, and mining activities (such as bulldozers and loaders). The EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, as long as they are the same or more stringent than the federal standards.

In the past decade, the EPA has established a number of emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of NO_X and particulate matter ($PM_{2.5}$) and because the EPA has identified DPM as a probable carcinogen. Implementation of the heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce particulate matter and NO_X emissions from diesel engines up to 95 percent in 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards.[3]

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The new standards reduced the amount of sulfur allowed by 97 percent for highway diesel fuel (from 500 parts per million by weight [ppmw] to 15 ppmw), and by 99 percent for off-highway diesel fuel (from about 3,000 ppmw to 15 ppmw). The low sulfur highway fuel (15 ppmw sulfur), also called ultra-low sulfur diesel (ULSD), is currently required for use by all vehicles in the U.S.

All of the above federal diesel engine and diesel fuel requirements have been adopted by California, in some cases with modifications making the requirements more stringent or the implementation dates sooner.

State Regulations

To address the issue of diesel emissions in the state, CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*.[4] In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. Many Plan measures have been approved and adopted, including the federal on-road and non-road diesel engine emission standards for new engines, and adoption of regulations for low sulfur fuel in California.

CARB has adopted and implemented a number of additional regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. CARB regulations require on-road diesel trucks to be retrofitted with particulate matter controls or replaced to meet 2010 or later engine standards that have much lower DPM

[3] USEPA, 2000. *Regulatory Announcement, Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. EPA420-F-00-057. December.
[4] California Air Resources Board, 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. October.

and $PM_{2.5}$ emissions. This regulation will substantially reduce these emissions between 2013 and 2023. While new trucks and buses will meet strict federal standards, CARB's program is intended to accelerate the rate at which the fleet either turns over so there are more cleaner vehicles on the road or is retrofitted to meet similar standards. With this regulation, older, more polluting trucks would be removed from the roads sooner.

CARB has also adopted and implemented regulations to reduce DPM and NO_X 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 NO_X 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, will significantly reduce emissions of DPM and NO_X.

Bay Area Air Quality Management District (BAAQMD)

BAAQMD has jurisdiction over an approximately 5,600-square mile area, commonly referred to as the San Francisco Bay Area (Bay Area). The District's boundary encompasses the nine San Francisco Bay Area counties, including Alameda County, Contra Costa County, Marin County, San Francisco County, San Mateo County, Santa Clara County, Napa County, southwestern Solano County, and southern Sonoma County.

BAAQMD is the lead agency in developing plans to address attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). The District also has permit authority over most types of stationary equipment utilized for the proposed project. The BAAQMD is responsible for permitting and inspection of stationary sources; enforcement of regulations, including setting fees, levying fines, and enforcement actions; and ensuring that public nuisances are minimized.

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.[5] 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 is being 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 will be 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 defines overburdened communities as areas located (i) within a census tract identified by the California

[5] See BAAQMD: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program , accessed 2/18/2021.

Communities Environmental Health Screening Tool (CalEnviroScreen), Version 4.0 implemented by OEHHA, as having an overall CalEnviroScreen score at or above the 70th percentile, or (ii) within 1,000 feet of any such census tract.[6] 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. The project site is within the San José CARE area but not within a BAAQMD overburdened area as identified by CalEnviroScreen as the Project site is scored at the 46th percentile.[7]

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[8] 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 California Environmental Quality Act (CEQA) requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for TACs, odors, and greenhouse gas (GHG) emissions. *Attachment 1* includes detailed community risk modeling methodology.

City of Santa Clara 2010 – 2035 General Plan.

On November 16, 2010, the City of Santa Clara adopted the *City of Santa Clara 2010 – 2035 General Plan.*[9] The general plan includes goals, policies, and actions to reduce air pollutants and exposure to toxic air containments. The following goals, policies, and actions are applicable to the proposed project and this assessment:

5.10.2 Air Quality Goals

5.10.2-G1 Improved air quality in Santa Clara and the region.

5.10.2-G2 Reduced greenhouse gas emissions that meet the State and regional goals and requirements to combat climate change.

5.10.2 Air Quality Policies

5.10.2-P3 Encourage implementation of technological advances that minimize public health hazards and reduce the generation of air pollutants.

5.10.2-P4 Encourage measures to reduce greenhouse gas emissions to reach 30 percent below 1990 levels by 2020.

5.10.2-P6 Require "Best Management Practices" for construction dust abatement.

Significance Thresholds

[6] See BAAQMD: https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-permits/2021-amendments/documents/20210722_01_appendixd_mapsofoverburdenedcommunities-pdf.pdf?la=en , accessed 10/1/2021.
[7] OEHAA, CalEnviroScreen 4.0 Maps https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40
[8] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.
[9] City of Santa Clara, 2010. *City of Santa Clara 2010 – 2035 General Plan*. November. Web: https://www.santaclaraca.gov/home/showdocument?id=56139

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA and these significance thresholds were contained in the District's 2011 CEQA Air Quality Guidelines. These thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA. The thresholds were challenged through a series of court challenges and were mostly upheld. BAAQMD updated the CEQA Air Quality Guidelines in 2017 to include the latest significance thresholds, which were used in this analysis and are summarized in Table 1. Impacts above these thresholds are considered potentially significant.

Table 1. BAAQMD CEQA Significance Thresholds

Criteria Air Pollutant	**Construction Thresholds**	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1000-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
Note: 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.		

Construction Impacts and Mitigation Measures

Project impacts related to increased community risk can occur either by generating emissions of TACs and air pollutants and by introducing a new sensitive receptor in proximity to an existing source of TACs. Temporary project construction activity would generate emissions of DPM from equipment and trucks and also generate dust on a temporary basis that could affect nearby sensitive receptors.

A community health risk assessment was prepared to address project construction impacts on the surrounding off-site sensitive receptors. Additionally, the project could introduce new residents that are sensitive receptors, who would be exposed to existing sources of TACs and localized air pollutants in the vicinity of the project. Therefore, the impact of the existing sources of TAC upon the existing sensitive receptors and new incoming sensitive receptors was assessed.

Community risk impacts are addressed by predicting increased lifetime cancer risk, the increase in annual $PM_{2.5}$ concentrations, and computing the Hazard Index (HI) for non-cancer health risks. Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust emissions pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. A health risk assessment of the project construction activities was conducted that evaluated potential health effects to nearby sensitive receptors from construction emissions of DPM and $PM_{2.5}$.[10] This assessment included dispersion

[10] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.

modeling to predict the offsite and onsite concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated. The methodology for computing community risks impacts is contained in *Attachment 1*.

Construction Period Emissions

The California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was used to estimate emissions from on-site construction activity, construction vehicle trips, and evaporative emissions. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The CARB EMission FACtors 2021 (EMFAC2021) model was used to predict emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[11] The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2021 vehicle emissions modeling outputs are included in *Attachment 3*.

CalEEMod Modeling

Land Use Inputs

The proposed project land uses were entered into CalEEMod as described in Table 2.

Table 2. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet (sf)	Acreage
Apartments Mid Rise	28	Dwelling Unit	27,860	0.40
Strip Mall	1.54	1,000-sf	1,540	
Enclosed Parking with Elevator	23	Parking Space	14,200	
Parking Lot	10	Parking Space	5,400	

Construction Inputs

CalEEMod computes annual emissions for construction that are based on the project type, size, and acreage. The model provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. The construction build-out scenario, including equipment list and schedule, were based on project-specific construction information provided by the project applicant.

The project construction equipment worksheet provided by the applicant included the schedule for each phase (included in *Attachment 2*). Within each phase, the quantity of equipment to be used along with the average hours per day and total number of workdays were based on provided information. Since different equipment would have different estimates of the working days per phase, the hours per day for each phase was computed by dividing the total number of hours that the equipment would be used by the total number of days in that phase. The construction schedule assumed that the earliest possible start date would be September 2023 and would be primarily built out over a period of approximately 17 months, or 375 construction workdays.

[11] See CARB's EMFAC2021 Emissions Inventory at https://arb.ca.gov/emfac/emissions-inventory.

Construction Truck Traffic Emissions

Construction would produce traffic in the form of worker trips and truck traffic. The traffic-related emissions are based on worker and vendor trip estimates produced by CalEEMod and haul trips that were computed based on the soil material imported and/or exported to the site and the estimate of concrete and asphalt truck trips. CalEEMod provides daily estimates of worker and vendor trips for each applicable phase. The total trips for those were computed by multiplying the daily trip rate by the number of days in that phase. Haul trips for grading were estimated from provided grading volumes by assuming each truck could carry 10 tons per load. The number of concrete and asphalt total round haul trips were estimated for the project and converted to total one-way trips, assuming two trips per delivery.

The latest version of the CalEEMod model is based on the older version of the CARB EMFAC2017 motor vehicle emission factor model. This model has been superseded by the EMFAC2021 model; however, CalEEMod has not been updated to include EMFAC2021. Therefore, the construction traffic information was combined with EMFAC2021 motor vehicle emissions factors. EMFAC2021 provides aggregate emission rates in grams per mile for each vehicle type. The vehicle mix for this study was based on CalEEMod default assumptions, where worker trips are assumed to be comprised of light-duty autos (EMFAC category LDA) and light duty trucks (EMFAC category LDT1and LDT2). Vendor trips are comprised of delivery and large trucks (EMFAC category MHDT and HHDT) and haul trips, including concrete trucks, are comprised of large trucks (EMFAC category HHDT). Travel distances are based on CalEEMod default lengths, which are 10.8 miles for worker travel, 7.3 miles for vendor trips and 20 miles for hauling (soil import/export). Since CalEEMod does not address concrete trucks, these were treated as vendor travel distances. Each trip was assumed to include an idle time of 5 minutes. Emissions associated with vehicle starts were also included. On road emissions in Santa Clara County for the year 2023 - 2025 were used in these calculations. Table 3 provides the traffic inputs that were combined with the EMFAC2021 emission database to compute vehicle emissions.

Table 3. Construction Traffic Data Used for EMFAC2021 Model Runs

CalEEMod Run/Land Uses and Construction Phase	Trips by Trip Type			Notes
	Total Worker[1]	Total Vendor[1]	Total Haul[2]	
Vehicle mix[1]	50% LDA 25% LDT1 25% LDT2	50% MHDT 50% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0 (Demo/Soil) 7.3 (Concrete/Asphalt)	CalEEMod default distance with 5-min truck idle time.
Site Preparation	3	-	-	CalEEMod default worker trips.
Grading	352	-	925	7,400-cy soil export. CalEEMod default worker trips.
Trenching	992	-	430	215 concrete-truck round trips. CalEEMod default worker trips.
Building Construction	6,031	1,304	112	56 concrete-truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	966	-	-	CalEEMod default worker trips.
Paving	420	-	8	35-cy asphalt hauling CalEEMod default worker trips.

Notes: [1] Based on 2023 – 2025 EMFAC2021 light-duty vehicle fleet mix for Santa Clara County.
[2] Includes grading trips estimated by CalEEMod based on amount of material to be removed. Concrete and asphalt trips estimated based on data provided by the applicant.

Community Health Risk from Project Construction

Construction Emissions

The CalEEMod model and EMFAC2021 emissions provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages as 0.02 tons (49 pounds). The on-road emissions are a result of haul truck travel during grading activities, worker travel, and vendor deliveries during construction. A trip length of half a mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod as less than 0.01 tons (1 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (i.e., residences, preschool) in the vicinity of the project construction area. The AERMOD dispersion model is a BAAQMD-recommended model for use in modeling

analysis of these types of emission activities for CEQA projects. [12,13] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

Construction Sources

To represent the construction equipment exhaust emissions, an area source emission release height of 20 feet (6 meters) was used for the area sources.[14] The release height incorporates both the physical release height from the construction equipment (i.e., the height of the exhaust pipe) and plume rise after it leaves the exhaust pipe. Plume rise is due to both the high temperature of the exhaust and the high velocity of the exhaust gas. It should be noted that when modeling an area source, plume rise is not calculated by the AERMOD dispersion model as it would be for a point source (exhaust stack). Therefore, the release height from an area source used to represent emissions from sources with plume rise, such as construction equipment, should be based on the height the exhaust plume is expected to achieve, not just the height of the top of the exhaust pipe. Emissions from vehicle travel on- and off-site were distributed among the exhaust emission area sources throughout the site.

For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of 7 feet (2 meters) was used for the area source. Fugitive dust emissions at construction sites come from a variety of sources, including truck and equipment travel, grading activities, truck loading (with loaders) and unloading (rear or bottom dumping), loaders and excavators moving and transferring soil and other materials, etc. All of these activities result in fugitive dust emissions at various heights at the point(s) of generation. Once generated, the dust plume will tend to rise as it moves downwind across the site and exit the site at a higher elevation than when it was generated. For all these reasons, a 7-foot release height was used as the average release height across the construction site. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources. Figure 1 shows the project construction site and receptors.

AERMOD Inputs and Meteorological Data

The modeling used a five-year data set (2013 – 2017) of hourly meteorological data from San José Airport prepared for use with the AERMOD model by BAAQMD. Construction emissions were modeled as occurring daily between 6:00 a.m. to 6:00 p.m., when the majority of construction activity is expected to occur. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2023 – 2025 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors. Receptor heights of 5 feet (1.5 meters) and 15 feet (4.5 meters) were used to represent the breathing height on the first and

[12] BAAQMD, 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en

[13] BAAQMD, 2020, *BAAQMD Health Risk Assessment Modeling Protocol.* December. Web: https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/baaqmd_hra_modeling_protocol-pdf.pdf?la=en

[14] California Air Resource Board, 2007. *Proposed Regulation for In-Use Off-Road Diesel Vehicles, Appendix D: Health Risk Methodology.* April. Web: https://ww3.arb.ca.gov/regact/2007/ordiesl07/ordiesl07.htm

second floors of nearby residences.[15] A receptor height of 3 feet (1 meter) was used to represent the breathing height of infants and children at the Kids on Campus Preschool.

Summary of Construction Community Risk Impacts

The maximum increased cancer risks were calculated using the modeled TAC concentrations combined with the Office of Environmental Health Hazard Assessment (OEHHA) guidance for age sensitivity factors and exposure parameters as recommended by BAAQMD (see *Attachment 1)*. Non-cancer health hazards and maximum $PM_{2.5}$ concentrations were also calculated and identified. Age-sensitivity factors reflect the greater sensitivity of infants and children to cancer causing TACs. Third-trimester, infant, child, and adult exposures were assumed to occur at all residences during the entire construction period, while infant and child exposures were assumed to occur at the preschool.

The maximum modeled annual $PM_{2.5}$ concentration was calculated based on combined exhaust and fugitive concentrations. The maximum computed HI value was based on the ratio of the maximum DPM concentration modeled and the chronic inhalation reference exposure level of 5 $\mu g/m^3$.

The maximum-modeled annual DPM and $PM_{2.5}$ concentrations were identified at nearby sensitive receptors (as shown in Figure 1) to find the maximally exposed individuals (MEI). Results of this assessment indicated that the construction MEI was located on the first floor (3 feet above ground) in the southeast corner of the Kids on Campus Preschool to the north of the project site. Modeling results also identified the residential receptor with the maximum construction impacts, which were less than that of the preschool MEI. Table 4 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities affecting the construction MEI. *Attachment 4* to this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

Summary of Project-Related Community Risks at the Off-Site Sensitive Receptors

As shown in Table 4, the unmitigated maximum cancer risks from construction activities at the preschool MEI location would exceed the BAAQMD single-source significance threshold. However, with the incorporation of the *Mitigation Measure AQ-1 and AQ-2*, the mitigated risk values would reduce emissions such that the cancer risk caused by construction would no longer exceed the BAAQMD single-source significance threshold. The unmitigated annual $PM_{2.5}$ concentration and HI at the preschool MEI, and all risk and hazard impacts at the residential maximum receptor, do not exceed their respective BAAQMD single-source significance thresholds.

[15] Bay Area Air Quality Management District, 2012, Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0. May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en

Table 4. Construction Risk Impacts at the Off-Site Sensitive Receptors

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact – Kids on Campus MEI				
Project Construction	Unmitigated	**23.09 (infant)**	0.06	0.01
	Mitigated*	1.83 (infant)	0.01	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated*	*No*	*No*	*No*
Most Affected Residential Receptor – First Floor (1.5 meter) Receptor				
Project Construction	Unmitigated	5.44 (infant)	0.03	0.01
	Mitigated*	0.43 (infant)	<0.01	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	*No*	***Yes***	*No*
	Mitigated*	*No*	*No*	*No*

* Construction equipment with Tier 4 engines and BMPs as Mitigation.

Figure 1. Locations of Project Construction Site, Off-Site Sensitive Receptors, and Maximum TAC Impacts (MEI)

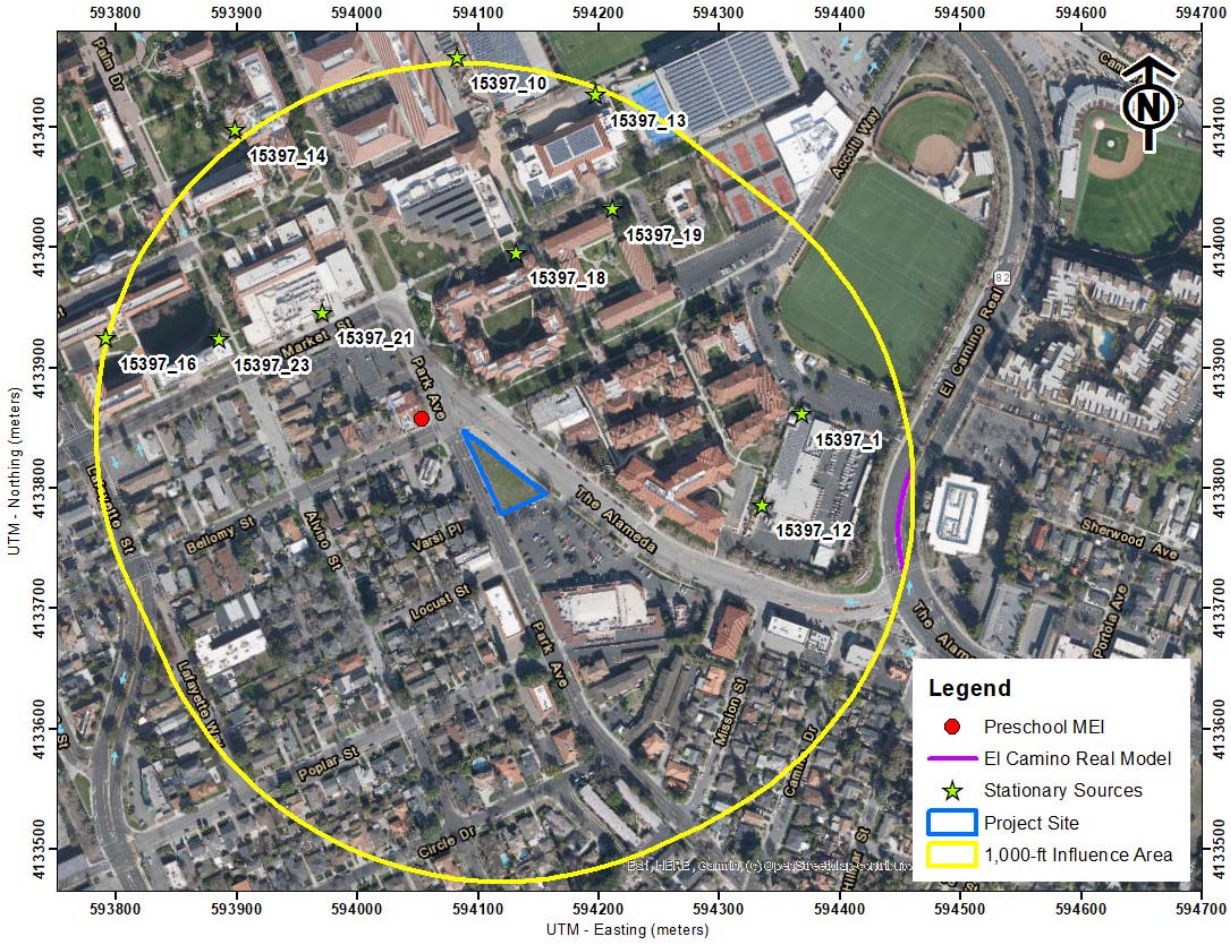


Cumulative Community Risks of all TAC Sources at the Off-Site Project MEI

Community health risk assessments typically look at all substantial sources of TACs that can affect sensitive receptors that are located within 1,000 feet of a project site (i.e., influence area). These sources include rail lines, highways, busy surface streets, and stationary sources identified by BAAQMD.

A review of the project area and based on provided traffic information indicated that one roadway within the influence area, El Camino Real, would have traffic exceeding 10,000 vehicles per day. Other nearby streets would have less than 10,000 vehicles per day. A review of BAAQMD's stationary source geographic information systems (GIS) map tool identified 10 stationary sources with the potential to affect the project site and MEI. Figure 2 shows the project area included within the influence area and the location of the MEI. Community risk impacts from these sources upon the MEIs reported in Table 5. Details of the modeling and community risk calculations are included in *Attachment 5*.

Figure 2. Project Site, Project MEI, and Nearby TAC and $PM_{2.5}$ Sources



Local Roadways – El Camino Real

A refined analysis of potential health impacts from vehicle traffic on El Camino Real was conducted. This analysis involved predicting emissions for the traffic volume and mix of vehicle types on the roadway near the project site and using an atmospheric dispersion model to predict exposure to TACs. The associated cancer risks were then computed based on the modeled exposures. *Attachment 1* includes a description of how community risk impacts, including cancer risk are computed.

Emission Rates

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for traffic on El Camino Real using the Caltrans version of the CARB EMFAC2017 emissions model, known as CT-EMFAC2017. CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and TACs, including DPM.[16] Emission processes modeled include running exhaust for DPM, $PM_{2.5}$ and total organic compounds (TOG), running evaporative losses for TOG, and tire and brake wear and fugitive road dust for $PM_{2.5}$. $PM_{2.5}$ 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 and from re-entrained roadway dust were included in the emissions estimate. DPM emissions are projected to decrease in the future as reflected in the CT-EMFAC2017 emissions data. Inputs to the model include region (Santa Clara County), type of road (major/collector), truck percentage for non-state highways in Santa Clara County (3.51 percent),[17] traffic mix assigned by CT-EMFAC2017 for the county, year of analysis (2023 – construction start year), and season (annual).

To estimate TAC and $PM_{2.5}$ emissions over the 30-year exposure period used for calculating the increased cancer risks for sensitive receptors at the MEI, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2023 (project construction year). 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 CT-EMFAC2017. Year 2023 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions, will decrease in the future.

Average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[18] which were then applied to the average daily traffic (ADT) volumes to obtain estimated hourly traffic volumes and emissions for the roadway. The ADT for El Camino Real

[16] The CT-EMFAC2017 version was used in the analysis because Caltrans has not yet release a CT-EMFAC version with the updated EMFAC2021 emissions that would provide TAC emission rates.
[17] Bay Area Air Quality Management District, 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en
[18] 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.

was calculated based on traffic data obtained from the traffic consultant.[19] The calculated ADT for El Camino Real would be 23,286 vehicles. An average travel speed of 35 miles per hour (mph) on El Camion Real was used for all hours of the day based on posted speed limit signs.

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the EPA AERMOD air quality dispersion model, which is recommended by the BAAQMD for this type of analysis.[20] TAC and $PM_{2.5}$ emissions from traffic on El Camino Real within 1,000 feet of the project site were evaluated. Vehicle traffic on the roadways was modeled using volume sources along a line (line volume sources); with line segments used for travel on the roadway. The same meteorological data and off-site sensitive receptors used in the previous dispersion modeling were used in the roadway modeling. Other inputs to the model included road geometry, hourly traffic emissions, and receptor locations. Annual TAC and $PM_{2.5}$ concentrations for 2023 from traffic on the roadway was calculated using the model. Concentrations were calculated at the preschool MEI with receptor heights of 3 feet (1 meter) to represent the breathing heights on the first floor of the preschool.

Computed Cancer and Non-Cancer Health Impacts

The cancer risk, $PM_{2.5}$ concentration, and HI impacts from El Camino Real on the project childcare MEI are shown in Table 5. Figure 2 shows the roadway links used for the modeling and receptor locations where concentrations were calculated. Details of the emission calculations, dispersion modeling, and cancer risk calculations for the receptors with the maximum cancer risk from El Camino Real traffic are provided in *Attachment 5*.

BAAQMD Permitted Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2020* geographic information system (GIS) map website.[21] This mapping tool identifies the location of nearby stationary sources and their estimated risk and hazard impacts. 10 sources were identified using this tool, with all the sources being diesel generator. The BAAQMD GIS website provided screening risks and hazards for these sources; therefore, a stationary source information request was not required to be submitted to BAAQMD.

The screening level risks and hazards provided by BAAQMD for the stationary sources were adjusted for distance using BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion Engines*. Community risk impacts from the stationary sources upon the preschool MEI are reported in Table 5. Note that the risks are reported for continuous exposure over 30 years with adjustments for infant and child exposure. Risks at the preschool would be less

[19] Email correspondence with Patrick Kallas, Project Manager, David J. Powers & Associates, Inc., August 17, 2022..
[20] BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012
[21] BAAQMD, *Stationary Source Screening Map*, 2022. Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3

because the exposure time of infants and children attending the preschool is much less than the BAAQMD cancer risk assumptions used to develop the screening levels.

Summary of Cumulative Health Risk Impact at Preschool MEI

Table 5 reports both the project and cumulative community risk impacts at the sensitive receptors most affected by construction (i.e., the MEI). The project would have an exceedance with respect to community risk caused by project construction since the unmitigated maximum cancer risk exceeds the BAAQMD single-source threshold. With the implementation of *Mitigation Measure AQ-1 and AQ-2*, the project's cancer risk would be lowered to a level below the single-source. The annual $PM_{2.5}$ concentration and HI, unmitigated and mitigated, do not exceed the single-source or cumulative-source thresholds.

Table 5. Impacts from Combined Sources at Preschool MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impacts				
Project Construction	Unmitigated	**23.09 (infant)**	0.06	0.01
	Mitigated	1.83 (infant)	0.01	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated	*No*	*No*	*No*
Cumulative Sources				
El Camino Real, ADT 23,286		0.03	<0.01	<0.01
Santa Clara University (Facility ID #15397_1, Generator), MEI at 1,000 feet		0.07	<0.01	<0.01
Santa Clara University (Facility ID #15397_10, Generator), MEI at 970 feet		0.17	<0.01	<0.01
Santa Clara University (Facility ID #15397_12, Generator), MEI at 950 feet		0.47	<0.01	<0.01
Santa Clara University (Facility ID #15397_13, Generator), MEI at 980 feet		0.29	<0.01	<0.01
Santa Clara University (Facility ID #15397_14, Generator), MEI at 910 feet		0.10	<0.01	<0.01
Santa Clara University (Facility ID #15397_16, Generator), MEI at 970 feet		0.32	<0.01	<0.01
Santa Clara University (Facility ID #15397_18, Generator), MEI at 510 feet		0.22	<0.01	<0.01
Santa Clara University (Facility ID #15397_19, Generator), MEI at 760 feet		0.09	<0.01	<0.01
Santa Clara University (Facility ID #15397_21, Generator), MEI at 370 feet		0.31	<0.01	<0.01
Santa Clara University (Facility ID #15397_23, Generator), MEI at 575 feet		0.14	<0.01	<0.01
Combined Sources	Unmitigated	25.30	<0.16	<0.11
	Mitigated	4.04	<0.11	<0.11
BAAQMD Cumulative Source Threshold		***100***	***0.8***	***10.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
	Mitigated	*No*	*No*	*No*

Mitigation Measure AQ-1: **Include measures to control dust and exhaust during construction.**

During any construction period ground disturbance, the applicant shall ensure that the project contractor implement measures to control dust and exhaust. Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a less-than-significant level. Additional measures are identified to reduce construction equipment exhaust emissions. The contractor shall implement the following best management practices that are required of all projects:

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. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

8. Post a publicly visible sign 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.

Effectiveness of Mitigation Measure AQ-1

The measures above are consistent with BAAQMD-recommended basic control measures for reducing fugitive particulate matter that are contained in the BAAQMD CEQA Air Quality Guidelines. These measures would also further reduce TAC emissions associated with construction activity.

Mitigation Measure AQ-2: Use construction equipment that has low diesel particulate matter exhaust emissions.

Implement a feasible plan to reduce DPM emissions by 60 percent such that increased cancer risk and annual $PM_{2.5}$ concentrations from construction would be reduced below TAC significance levels as follows:

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 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 3 engines and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices that altogether achieve a 60 percent reduction in particulate matter exhaust in comparison to uncontrolled equipment; alternatively (or in combination).

2. Alternatively, the applicant may develop another construction operations plan demonstrating that the construction equipment used on-site would achieve a reduction in construction diesel particulate matter emissions by 60 percent or greater. Elements of the plan could include a combination of some of the following measures:
    - Implementation of No. 1 above to use Tier 4 engines or alternatively fueled equipment,
    - Installation of electric power lines during early construction phases to avoid use of diesel generators and compressors,
    - Use of electrically-powered equipment,
    - Forklifts and aerial lifts used for exterior and interior building construction shall be electric or propane/natural gas powered,
    - Change in construction build-out plans to lengthen phases, and
    - Implementation of different building techniques that result in less diesel equipment usage.

    Such a construction operations plan would be subject to review by an air quality expert and approved by the City prior to construction.

Effectiveness of Mitigation Measure AQ-1 and AQ-2

CalEEMod was used to compute emissions associated with this mitigation measure assuming that all equipment met U.S. EPA Tier 4 Interim engine standards and BAAQMD best management practices for construction were included. With these implemented, the project's construction cancer risk levels (assuming infant exposure) would be reduced by 92 percent to 1.83 chances per million. Note that use of equipment that does not meet Tier 4 standards but includes CARB Level 3 verifiable diesel emission control devices would achieve about an 85-

percent reduction and meet the requirements of this mitigation measure. As a result, the project's construction risks would be reduced below the BAAQMD single-source threshold.

Non-CEQA: On-site Community Risk Assessment for TAC Sources - New Project Residences

In addition to evaluating health impact from project construction, a health risk assessment was completed to assess the impact that the existing TAC sources would have on the new proposed sensitive receptors (residents) that the project would introduce. The same TAC sources identified above were used in this health risk assessment.[22] Figure 3 shows the on-site sensitive receptors in relation to the nearby TAC sources. All on-site community task results are listed in Table 6. *Attachment 5* includes the dispersion modeling and risk calculations for TAC source impacts upon the proposed on-site sensitive receptors.

Local Roadways – El Camino Real

The roadway analysis for the project residents was conducted in the same manner as described above for the off-site MEI. However, year 2025 (operational year) was conservatively assumed as being representative of future conditions, instead of 2023 (construction year). An analysis based on 2025 resulted in an increased ADT on El Camino Real of 23,733 vehicles. On-site receptors were placed throughout the project site with a spacing of 7 meters (23 feet). Roadway impacts were modeled at receptor heights of 5 feet (1.5 meters) and 21 feet (6.4 meters) representing sensitive receptors on the first and second floors of the proposed building. The portion of the roadway included in the modeling are shown in Figure 3 along with the project site and receptor locations where impacts were modeled.

Maximum increased cancer risks were calculated for the residents at the project site using the maximum modeled TAC concentrations. A 30-year exposure period was used in calculating cancer risks assuming the residents would include third trimester pregnancy and infants/children and were assumed to be in the new homes for 24 hours per day for 350 days per year. The highest impacts from El Camino Real occurred at a receptor on the first floor in the southeast corner of the project site. Cancer risks associated with the roadway are greatest closest to the roadway and decrease with distance from the road. The roadway community risk impacts at the project site are shown in Table 6. Details of the emission calculations, dispersion modeling, and cancer risk calculations are contained in *Attachment 5.*

[22] We note that to the extent this analysis considers *existing* air quality issues in relation to the impact on *future residents* of the Project, it does so for informational purposes only pursuant to the judicial decisions in *CBIA v. BAAQMD* (2015) 62 Cal.4th 369, 386 and *Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201 Cal.App.4th 455, 473, which confirm that the impacts of the environment on a project are excluded from CEQA unless the project itself "exacerbates" such impacts.

Stationary Sources

The stationary source screening analysis for the new project sensitive receptors was conducted in the same manner as described above for the construction MEI. Table 6 includes the health risk assessment results from the stationary sources.

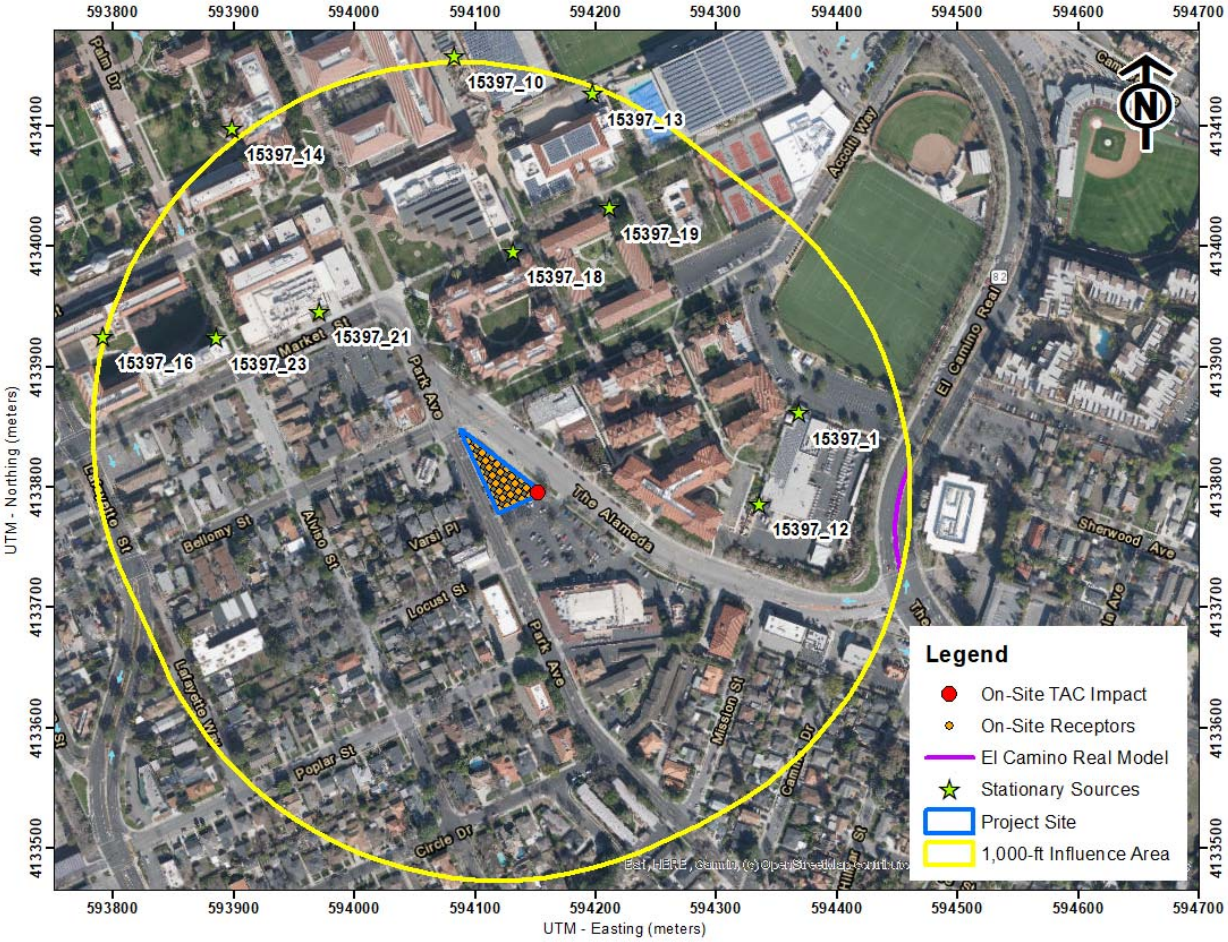
Summary of Cumulative Community Risks at the Project Site

Community risk impacts from the existing and TAC sources upon the project site are reported in Table 6. The risks from the singular TAC sources are compared against the BAAQMD single-source threshold. The risks from all the sources are then combined and compared against the BAAQMD cumulative-source threshold. As shown, none of the sources exceed the single-source or cumulative-source thresholds.

Table 6. Impacts from Combined Sources to Project Site Receptors

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
El Camino Real, ADT 23,733	0.04	<0.01	<0.01
Santa Clara University (Facility ID #15397_1, Generator), MEI at 1,000 feet	0.13	<0.01	<0.01
Santa Clara University (Facility ID #15397_10, Generator), MEI at 970 feet	0.17	<0.01	<0.01
Santa Clara University (Facility ID #15397_12, Generator), MEI at 950 feet	1.05	<0.01	<0.01
Santa Clara University (Facility ID #15397_13, Generator), MEI at 980 feet	0.29	<0.01	<0.01
Santa Clara University (Facility ID #15397_14, Generator), MEI at 910 feet	0.10	<0.01	<0.01
Santa Clara University (Facility ID #15397_16, Generator), MEI at 970 feet	0.26	<0.01	<0.01
Santa Clara University (Facility ID #15397_18, Generator), MEI at 510 feet	0.26	<0.01	<0.01
Santa Clara University (Facility ID #15397_19, Generator), MEI at 760 feet	0.11	<0.01	<0.01
Santa Clara University (Facility ID #15397_21, Generator), MEI at 370 feet	0.21	<0.01	<0.01
Santa Clara University (Facility ID #15397_23, Generator), MEI at 575 feet	0.13	<0.01	<0.01
BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?	*No*	*No*	*No*
Cumulative Total	2.75	<0.11	<0.11
BAAQMD Cumulative Source Threshold	***100***	***0.8***	***10.0***
Exceed Threshold?	*No*	*No*	*No*

Figure 3. Locations of Project Site, On-Site Residential Receptors, Roadway Models, Stationary Sources, and Maximum TAC Impacts



Supporting Documentation

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

Attachment 2 includes the CalEEMod output for project construction emissions. Also included are any modeling assumptions.

Attachment 3 includes the EMFAC2021 emissions modeling. The input files for these calculations are voluminous and are available upon request in digital format.

Attachment 4 is the construction health risk assessment. This includes the summary of the dispersion modeling and the cancer risk calculations for construction. 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 cumulative community risk calculations, modeling results, and health risk calculations from sources affecting the construction MEI and project site 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.[23] 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.[24] 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.[25] 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

[23] 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.
[24] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[25] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways). For workers, assumed to be adults, 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

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

Parameter	*Exposure Type* →	Infant		Child	Adult
	Age Range →	3rd Trimester	0<2	2 < 16	16 - 30
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day) 80th Percentile Rate		273	758	572	261
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 2: CalEEMod Modeling Inputs and Outputs

Air Quality/Noise Construction Information Data Request

Project Name: 2655 The Alameda - Construction Activities (does not include Environmental Remediation Activities)

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size	39 Dwelling Units	0.4 total project acres disturbed	
	26235 s.f. residential		
	1540 s.f. retail		
	0 s.f. office/commercial		
	1,625 s.f. other, specify: Level 1 Entry, Common Rm		
	14200 s.f. parking garage	23 spaces	
	5400 s.f. parking lot	10 spaces	
Construction Days	9/1/2023 to	2/1/2025	
Construction Hours	6:00 am to	6:00 pm	

Pile Driving? Y/N? N

Project include on-site GENERATOR OR FIRE PUMP during project OPERATION (not construction)? Y/N? __N__

IF YES (if BOTH separate values) -->

Kilowatts/Horsepower: _____

Fuel Type: _____

Location in project (Plans Desired if Available):

DO NOT MULTIPLY EQUIPMENT HOURS/DAY BY THE QUANTITY OF EQUIPMENT

Quantity	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	HP Annual Hours	Comments
	Demolition - not required	**Start Date:**		**Total phase:**				**Overall Import/Export Volumes**
		End Date:						
	Concrete/Industrial Saws	81	0.73			#DIV/0!	0	**Demolition Volume - not required**
	Excavators	158	0.38			#DIV/0!	0	Square footage of buildings to be demolished
	Rubber-Tired Dozers	247	0.4			#DIV/0!	0	(*or* total tons to be hauled)
	Tractors/Loaders/Backhoes	97	0.37			#DIV/0!	0	**_?_** square feet *or*
	Other Equipment?							**_?_** Hauling volume (tons)
								Any pavement demolished and hauled? **_?_ tons**
	Site Preparation	**Start Date:**	**9/6/2023**	**Total phase:**	**1**			
		End Date:	**9/7/2023**					
	Graders	187	0.41	0		0	0	
	Rubber Tired Dozers	247	0.4	0		0	0	
1	Tractors/Loaders/Backhoes	97	0.37	8	1	8	287	remove existing hardscape and grubb
	Other Equipment?							
	Grading / Excavation	**Start Date:**	**9/8/2023**	**Total phase:**	**44**			
		End Date:	**11/8/2023**					**Soil Hauling Volume**
1	Excavators	158	0.38	8	15	2.72727273	7205	Export volume = **_7400_** cubic yards?
	Graders	187	0.41			0	0	Import volume = **none** cubic yards?
	Rubber Tired Dozers	247	0.4			0	0	
	Concrete/Industrial Saws	81	0.73			0	0	
1	Tractors/Loaders/Backhoes	97	0.37	8	22	4	6317	
1	*Other Equipment?*	221	0.5	8	5		4420	Shoring Drill Rig
	Trenching/Foundation/Basement	**Start Date:**	**11/9/2023**	**Total phase:**	**124**			**Basement Construction to Level 1**
		End Date:	**5/9/2024**					
	Tractor/Loader/Backhoe	97	0.37			0	0	**Cement Trucks _215_ Total Round-Trips**
	Excavators	158	0.38			0	0	
2	*Other Equipment? Fork-lifts*	89	0.2	8	80	5.16129032	22784	
1	*Cranes*	231	0.29	8	20	1.29032258	10718	
	Building - Exterior	**Start Date:**	**5/10/2024**	**Total phase:**	**163**			**Cement Trucks 56 Total Round-Trips**
		End Date:	**12/3/2024**					
1	Cranes	231	0.29	8	40	1.96319018	21437	Electric? (Y/N) N___ Otherwise assumed diesel
1	Forklifts	89	0.2	6	145	5.33742331	15486	Liquid Propane (LPG)? (Y/N) N___ Otherwise Assumed diesel
	Generator Sets	84	0.74			0	0	Or temporary line power? (Y/N) __N_
	Tractors/Loaders/Backhoes	97	0.37			0	0	
1	Welders	46	0.45	8	4	0.19631902	662	
	Other Equipment? Manlift			0	0	0		assuming no manlifts required
Building - Interior/Architectural Coating		**Start Date:**	**8/1/2024**	**Total phase:**	**138**			
		End Date:	**2/1/2025**					
4	Air Compressors	78	0.48	8	65	3.76811594	77875	
	Aerial Lift	62	0.31	0	0	0	0	
	Other Equipment?							
	Paving	**Start Date:**	**11/1/2024**	**Total phase:**	**28**			
		End Date:	**12/15/2024**					
	Cement and Mortar Mixers	9	0.56	0		0	0	
1	Pavers	130	0.42	8	2	0.57142857	874	
1	Paving Equipment	132	0.36	8	2	0.57142857	760	**Asphalt? yes_35_cubic yards or no_ round trips?**
1	Rollers	80	0.38	8	2	0.57142857	486	
2	Tractors/Loaders/Backhoes	97	0.37	8	3	0.85714286	1723	
1	*Other Equipment? - Concrete/Industrial Saws*	81	0.73	4	5	0.71428571	1182.6	
	Additional Phases	**Start Date:**		**Total phase:**				
		Start Date:						
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	
						#DIV/0!	0	

Equipment types listed in "Equipment Types" worksheet tab.

Equipment listed in this sheet is to provide an example of inputs

It is assumed that water trucks would be used during grading

Add or subtract phases and equipment, as appropriate

Modify horsepower or load factor, as appropriate

Complete one sheet for each project component

Traffic Consultant Trip Gen						CalEEMod Default		
Land Use		Size	Daily Trips	New Trips	Weekday Trip Gen	Weekday	Sat	Sun
Apartments Mid Rise	DU	39	177	164	***4.21***	5.44	4.91	4.09
Residential/Retail Internal Capture			*-13*			*Rev*	***3.80***	***3.16***
Strip Mall	KSF	1.54	84	50	***32.47***	44.32	42.04	20.43
Residential/Retail Internal Capture			*-13*			*Rev*	***30.80***	***14.97***
Pass-By Reduction			*-21*					

		Daily		AM Peak Hour				PM Peak Hour			
		Trip		Pk-Hr	Trips			Pk-Hr	Trips		
Land Use	Size	Rate	Trips	Rate	In	Out	Total	Rate	In	Out	Total
Proposed Residential[1]	39 du	4.54	177	0.37	3	11	14	0.39	9	6	15
- Residential/Retail Internal Capture (15%)[3]			-13		0	-1	-1		-1	-1	-2
Sub-Total Residential			*164*		*3*	*10*	*13*		*8*	*5*	*13*
Retail[2]	*1,540 s.f.*	54.45	84	2.36	2	2	4	6.59	5	5	10
- Residential/Retail Internal Capture (15%)[3]			-13		-1	0	-1		-1	-1	-2
- Pass-By Reduction (30%)[4]			-21		0	-1	-1		-1	-1	-2
Sun-Total Retail			*50*		*1*	*1*	*2*		*3*	*3*	*6*
Net Project Trips			**214**		**4**	**11**	**15**		**11**	**8**	**19**

Source: ITE *Trip Generation Manual*, *11th Edition*. VTA *Transportation Impact Analysis Guidelines*, October 2014

Notes:

1. Mid-Rise Multifamily Housing (ITE Land Use 221): average trip rates in trips per dwelling unit were used.
2. Strip Retail Plaza (Land Use 822): average trip rates in trips per 1,000 s.f. were used.
3. Residential/retail internal trip reductions were applied to the project per the *VTA's TIA Guidelines*.
4. An average 30% pass-by trip reduction was applied based the maximum allowable pass-by trip reduction rate in the VTA TIA Guidelines.

Construction Criteria Air Pollutants						
Unmitigated	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	**CO2e**	
Year	Tons				MT	
Construction Equipment						
2023	0.01	0.07	0.004	0.003	13.43	
2024-2025	0.26	0.42	0.02	0.02	76.66	
EMFAC						
2023	0.003	0.02	0.002	0.001	21.47	
2024-2025	0.01	0.08	0.01	0.002	73.32	
Total Construction Emissions by Year						
2023	0.01	0.09	0.01	0.00	34.90	
2024-2025	0.27	0.50	0.03	0.02	149.98	
	Total Construction Emissions					
Tons	0.29	0.67	0.04	0.03	258.20	
Pounds/Workdays	*Average Daily Emissions*				Workdays	
2023	0.25	2.21	0.12	0.09		**84**
2024-2025	1.87	3.43	0.18	0.15		**291**
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		
	Total Construction Emissions					
Pounds	2.12	5.65	0.31	0.25	0.00	
Average	1.56	3.59	0.20	0.15	0.00	375.00
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		

Operational Criteria Air Pollutants						
Unmitigated	ROG	NOX	Total PM10	Total PM2.5		
Year 2025	Tons					
Total	0.26	0.08	0.15	0.04		
	Existing Use Emissions					
	Net Annual Operational Emissions					
Tons/year	0.26	0.08	0.15	0.04		
Threshold - Tons/year	**10.0**	**10.0**	**15.0**	**10.0**		
	Average Daily Emissions					
Pounds Per Day	1.44	0.45	0.81	0.21		
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		

Category	**CO2e**			
	Project	Existing	Project 2030	Existing
Area	0.49			
Energy	48.20			
Mobile	146.31			
Waste	9.84			
Water	4.47			
TOTAL	209.30	0.00	0.00	0.00
Net GHG Emissions		209.30		0.00
Service Population	101.79			
Per Capita Emissions		2.06		0.00

	39	units
CA DOF 2021 =	2.61	pphh

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	23.00	Space	0.00	14,200.00	0
Parking Lot	10.00	Space	0.00	5,400.00	0
Apartments Mid Rise	39.00	Dwelling Unit	0.40	27,860.00	112
Strip Mall	1.54	1000sqft	0.00	1,540.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2025
Utility Company	Silicon Valley Power				
CO2 Intensity (lb/MWhr)	307.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Provided construction data - total project acres and square footages.

Construction Phase - Provided schedule - construction worksheet.

Off-road Equipment - Provided in construction and equipment list.

Off-road Equipment - Provided in construction and equipment list.

Off-road Equipment - Provided in construction and equipment list.0

Off-road Equipment - Provided in construction and equipment list.

Off-road Equipment - Provided in construction and equipment list.

Off-road Equipment - Provided in construction and equipment list.

Date: 8/25/2022 12:15 PM

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Grading - Grading = 7,400-cy exported.

Trips and VMT - EMFAC2021 adjustment 0 trips, building construction = 56 cement truck round trips, trenching = 215 cement truck round trips, paving = 35-cy asphalt.

Vehicle Trips - Provided trip gen with reductions.

Vehicle Emission Factors - EMFAC2021 Vehicle Emissions Factors Santa Clara County 2025.

Fleet Mix - EMFAC2021 Fleet Mix Santa Clara County 2025.

Woodstoves - No hearths.

Energy Use - Santa Clara Reach Code - no natural gas - converted to electricity.

Water And Wastewater - Wastewater treatment - 100% aerobic - no septic tanks or lagoons.

Construction Off-road Equipment Mitigation - BMPs, tier 4 interim mitigation.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim

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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	2.00	44.00
tblConstructionPhase	NumDays	100.00	163.00
tblConstructionPhase	NumDays	5.00	138.00
tblConstructionPhase	NumDays	5.00	28.00
tblEnergyUse	NT24E	3,054.10	3,978.74
tblEnergyUse	NT24NG	3,155.00	0.00
tblEnergyUse	T24E	70.89	1,602.68
tblEnergyUse	T24E	2.46	3.15
tblEnergyUse	T24NG	5,226.68	0.00
tblEnergyUse	T24NG	2.34	0.00
tblFireplaces	FireplaceDayYear	11.14	0.00
tblFireplaces	FireplaceHourDay	3.50	0.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	5.85	0.00
tblFireplaces	NumberNoFireplace	1.56	0.00
tblFireplaces	NumberWood	6.63	0.00
tblFleetMix	HHD	6.3770e-003	7.4400e-003
tblFleetMix	HHD	6.3770e-003	7.4400e-003
tblFleetMix	HHD	6.3770e-003	7.4400e-003
tblFleetMix	HHD	6.3770e-003	7.4400e-003
tblFleetMix	LDA	0.57	0.53

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tblFleetMix	LDA	0.57	0.53
tblFleetMix	LDA	0.57	0.53
tblFleetMix	LDA	0.57	0.53
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT1	0.06	0.04
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LDT2	0.19	0.23
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	5.1580e-003	5.7400e-003
tblFleetMix	LHD2	5.1580e-003	5.7400e-003
tblFleetMix	LHD2	5.1580e-003	5.7400e-003
tblFleetMix	LHD2	5.1580e-003	5.7400e-003
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MCY	0.02	0.02
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	2.7200e-003	2.5850e-003
tblFleetMix	MH	2.7200e-003	2.5850e-003

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tblFleetMix	MH	2.7200e-003	2.5850e-003
tblFleetMix	MH	2.7200e-003	2.5850e-003
tblFleetMix	MHD	8.0300e-003	9.4250e-003
tblFleetMix	MHD	8.0300e-003	9.4250e-003
tblFleetMix	MHD	8.0300e-003	9.4250e-003
tblFleetMix	MHD	8.0300e-003	9.4250e-003
tblFleetMix	OBUS	8.9300e-004	1.0570e-003
tblFleetMix	OBUS	8.9300e-004	1.0570e-003
tblFleetMix	OBUS	8.9300e-004	1.0570e-003
tblFleetMix	OBUS	8.9300e-004	1.0570e-003
tblFleetMix	SBUS	9.0000e-004	6.8400e-004
tblFleetMix	SBUS	9.0000e-004	6.8400e-004
tblFleetMix	SBUS	9.0000e-004	6.8400e-004
tblFleetMix	SBUS	9.0000e-004	6.8400e-004
tblFleetMix	UBUS	3.7200e-004	4.1300e-004
tblFleetMix	UBUS	3.7200e-004	4.1300e-004
tblFleetMix	UBUS	3.7200e-004	4.1300e-004
tblFleetMix	UBUS	3.7200e-004	4.1300e-004
tblGrading	MaterialExported	0.00	7,400.00
tblLandUse	LandUseSquareFeet	9,200.00	14,200.00
tblLandUse	LandUseSquareFeet	4,000.00	5,400.00
tblLandUse	LandUseSquareFeet	39,000.00	27,860.00
tblLandUse	LotAcreage	0.21	0.00
tblLandUse	LotAcreage	0.09	0.00
tblLandUse	LotAcreage	1.03	0.40
tblLandUse	LotAcreage	0.04	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	UsageHours	6.00	3.80
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	4.00	2.00
tblOffRoadEquipment	UsageHours	6.00	5.30
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.60
tblOffRoadEquipment	UsageHours	7.00	0.60
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	0.90
tblTripsAndVMT	HaulingTripNumber	925.00	0.00
tblTripsAndVMT	VendorTripNumber	8.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00
tblTripsAndVMT	WorkerTripNumber	37.00	0.00
tblTripsAndVMT	WorkerTripNumber	7.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleEF	HHD	0.02	0.23
tblVehicleEF	HHD	0.05	0.12
tblVehicleEF	HHD	6.32	5.18
tblVehicleEF	HHD	0.41	0.76

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tblVehicleEF	HHD	5.9250e-003	6.8500e-004
tblVehicleEF	HHD	1,030.26	813.97
tblVehicleEF	HHD	1,386.58	1,586.83
tblVehicleEF	HHD	0.05	0.02
tblVehicleEF	HHD	0.16	0.13
tblVehicleEF	HHD	0.22	0.25
tblVehicleEF	HHD	6.0000e-006	1.4000e-005
tblVehicleEF	HHD	5.35	3.97
tblVehicleEF	HHD	2.67	1.77
tblVehicleEF	HHD	2.32	2.75
tblVehicleEF	HHD	2.5050e-003	2.0970e-003
tblVehicleEF	HHD	0.06	0.08
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.03
tblVehicleEF	HHD	2.3970e-003	2.0000e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8870e-003	8.7820e-003
tblVehicleEF	HHD	0.02	0.02
tblVehicleEF	HHD	1.0000e-006	0.00
tblVehicleEF	HHD	2.0000e-006	1.6100e-004
tblVehicleEF	HHD	8.6000e-005	4.8000e-005
tblVehicleEF	HHD	0.43	0.33
tblVehicleEF	HHD	1.0000e-006	0.00
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	3.8000e-005	4.3200e-004
tblVehicleEF	HHD	2.0000e-006	0.00
tblVehicleEF	HHD	9.5860e-003	7.0990e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	2.0000e-006	1.6100e-004

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tblVehicleEF	HHD	8.6000e-005	4.8000e-005
tblVehicleEF	HHD	0.49	0.59
tblVehicleEF	HHD	1.0000e-006	0.00
tblVehicleEF	HHD	0.08	0.14
tblVehicleEF	HHD	3.8000e-005	4.3200e-004
tblVehicleEF	HHD	3.0000e-006	0.00
tblVehicleEF	LDA	1.5230e-003	1.8410e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.49	0.61
tblVehicleEF	LDA	2.00	2.71
tblVehicleEF	LDA	226.89	237.67
tblVehicleEF	LDA	48.21	61.73
tblVehicleEF	LDA	3.7350e-003	3.8850e-003
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	0.15	0.22
tblVehicleEF	LDA	0.04	7.1370e-003
tblVehicleEF	LDA	1.2360e-003	1.1200e-003
tblVehicleEF	LDA	1.6250e-003	1.8490e-003
tblVehicleEF	LDA	0.02	2.4980e-003
tblVehicleEF	LDA	1.1380e-003	1.0310e-003
tblVehicleEF	LDA	1.4940e-003	1.7000e-003
tblVehicleEF	LDA	0.03	0.26
tblVehicleEF	LDA	0.08	0.08
tblVehicleEF	LDA	0.03	0.00
tblVehicleEF	LDA	5.5720e-003	6.9420e-003
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.18	0.27
tblVehicleEF	LDA	2.2440e-003	2.3490e-003

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tblVehicleEF	LDA	4.7700e-004	6.1000e-004
tblVehicleEF	LDA	0.03	0.26
tblVehicleEF	LDA	0.08	0.08
tblVehicleEF	LDA	0.03	0.00
tblVehicleEF	LDA	8.1000e-003	0.01
tblVehicleEF	LDA	0.03	0.20
tblVehicleEF	LDA	0.19	0.30
tblVehicleEF	LDT1	3.1240e-003	5.5770e-003
tblVehicleEF	LDT1	0.05	0.10
tblVehicleEF	LDT1	0.77	1.31
tblVehicleEF	LDT1	2.16	4.86
tblVehicleEF	LDT1	272.37	319.18
tblVehicleEF	LDT1	58.50	84.00
tblVehicleEF	LDT1	5.2980e-003	8.6270e-003
tblVehicleEF	LDT1	0.02	0.04
tblVehicleEF	LDT1	0.06	0.11
tblVehicleEF	LDT1	0.20	0.36
tblVehicleEF	LDT1	0.04	9.2190e-003
tblVehicleEF	LDT1	1.5310e-003	1.8130e-003
tblVehicleEF	LDT1	1.9900e-003	2.7500e-003
tblVehicleEF	LDT1	0.02	3.2270e-003
tblVehicleEF	LDT1	1.4090e-003	1.6690e-003
tblVehicleEF	LDT1	1.8300e-003	2.5290e-003
tblVehicleEF	LDT1	0.07	0.56
tblVehicleEF	LDT1	0.13	0.16
tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.07	0.44
tblVehicleEF	LDT1	0.25	0.50

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tblVehicleEF	LDT1	2.6950e-003	3.1550e-003
tblVehicleEF	LDT1	5.7900e-004	8.3000e-004
tblVehicleEF	LDT1	0.07	0.56
tblVehicleEF	LDT1	0.13	0.16
tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT1	0.02	0.04
tblVehicleEF	LDT1	0.07	0.44
tblVehicleEF	LDT1	0.27	0.54
tblVehicleEF	LDT2	2.6570e-003	2.5920e-003
tblVehicleEF	LDT2	0.06	0.08
tblVehicleEF	LDT2	0.69	0.78
tblVehicleEF	LDT2	2.60	3.42
tblVehicleEF	LDT2	290.83	327.62
tblVehicleEF	LDT2	63.01	84.01
tblVehicleEF	LDT2	5.2770e-003	5.6470e-003
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.05	0.06
tblVehicleEF	LDT2	0.23	0.31
tblVehicleEF	LDT2	0.04	8.8600e-003
tblVehicleEF	LDT2	1.3020e-003	1.2920e-003
tblVehicleEF	LDT2	1.6610e-003	2.0610e-003
tblVehicleEF	LDT2	0.02	3.1010e-003
tblVehicleEF	LDT2	1.1980e-003	1.1890e-003
tblVehicleEF	LDT2	1.5270e-003	1.8950e-003
tblVehicleEF	LDT2	0.06	0.28
tblVehicleEF	LDT2	0.11	0.08
tblVehicleEF	LDT2	0.06	0.00
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.06	0.21

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tblVehicleEF	LDT2	0.26	0.35
tblVehicleEF	LDT2	2.8770e-003	3.2380e-003
tblVehicleEF	LDT2	6.2400e-004	8.3000e-004
tblVehicleEF	LDT2	0.06	0.28
tblVehicleEF	LDT2	0.11	0.08
tblVehicleEF	LDT2	0.06	0.00
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	0.06	0.21
tblVehicleEF	LDT2	0.29	0.39
tblVehicleEF	LHD1	4.8220e-003	5.1940e-003
tblVehicleEF	LHD1	7.2910e-003	7.2220e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	0.18	0.20
tblVehicleEF	LHD1	0.66	0.82
tblVehicleEF	LHD1	1.01	2.16
tblVehicleEF	LHD1	8.77	8.60
tblVehicleEF	LHD1	764.47	764.97
tblVehicleEF	LHD1	11.28	17.60
tblVehicleEF	LHD1	7.4300e-004	6.3700e-004
tblVehicleEF	LHD1	0.04	0.04
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	0.05	0.05
tblVehicleEF	LHD1	0.57	0.59
tblVehicleEF	LHD1	0.29	0.42
tblVehicleEF	LHD1	8.5700e-004	6.8500e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.8070e-003	9.4200e-003
tblVehicleEF	LHD1	9.0910e-003	0.01
tblVehicleEF	LHD1	2.3900e-004	2.0600e-004

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tblVehicleEF	LHD1	8.2000e-004	6.5600e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4520e-003	2.3550e-003
tblVehicleEF	LHD1	8.6510e-003	0.01
tblVehicleEF	LHD1	2.2000e-004	1.8900e-004
tblVehicleEF	LHD1	1.8120e-003	0.12
tblVehicleEF	LHD1	0.07	0.03
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	9.4400e-004	0.00
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.19	0.17
tblVehicleEF	LHD1	0.06	0.11
tblVehicleEF	LHD1	8.5000e-005	8.4000e-005
tblVehicleEF	LHD1	7.4620e-003	7.4710e-003
tblVehicleEF	LHD1	1.1200e-004	1.7400e-004
tblVehicleEF	LHD1	1.8120e-003	0.12
tblVehicleEF	LHD1	0.07	0.03
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	9.4400e-004	0.00
tblVehicleEF	LHD1	0.10	0.10
tblVehicleEF	LHD1	0.19	0.17
tblVehicleEF	LHD1	0.07	0.12
tblVehicleEF	LHD2	2.9270e-003	3.0230e-003
tblVehicleEF	LHD2	6.3420e-003	6.4550e-003
tblVehicleEF	LHD2	7.0910e-003	0.01
tblVehicleEF	LHD2	0.14	0.14
tblVehicleEF	LHD2	0.56	0.53
tblVehicleEF	LHD2	0.57	1.20
tblVehicleEF	LHD2	13.74	13.69

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tblVehicleEF	LHD2	740.94	811.00
tblVehicleEF	LHD2	7.36	9.64
tblVehicleEF	LHD2	1.7280e-003	1.6800e-003
tblVehicleEF	LHD2	0.07	0.08
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.68	0.81
tblVehicleEF	LHD2	0.16	0.23
tblVehicleEF	LHD2	1.4520e-003	1.3890e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.2200e-004	9.1000e-005
tblVehicleEF	LHD2	1.3890e-003	1.3290e-003
tblVehicleEF	LHD2	0.04	0.03
tblVehicleEF	LHD2	2.6970e-003	2.6660e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	1.1200e-004	8.4000e-005
tblVehicleEF	LHD2	9.1300e-004	0.06
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.8500e-004	0.00
tblVehicleEF	LHD2	0.11	0.11
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	7.1520e-003	7.8120e-003
tblVehicleEF	LHD2	7.3000e-005	9.5000e-005
tblVehicleEF	LHD2	9.1300e-004	0.06
tblVehicleEF	LHD2	0.04	0.02

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tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.8500e-004	0.00
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	MCY	0.32	0.16
tblVehicleEF	MCY	0.25	0.18
tblVehicleEF	MCY	18.37	12.31
tblVehicleEF	MCY	9.09	7.97
tblVehicleEF	MCY	210.00	187.27
tblVehicleEF	MCY	60.43	47.31
tblVehicleEF	MCY	0.07	0.04
tblVehicleEF	MCY	0.02	7.6910e-003
tblVehicleEF	MCY	1.14	0.56
tblVehicleEF	MCY	0.27	0.13
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	2.0310e-003	1.9250e-003
tblVehicleEF	MCY	2.9300e-003	3.4640e-003
tblVehicleEF	MCY	5.0400e-003	4.2000e-003
tblVehicleEF	MCY	1.8970e-003	1.7990e-003
tblVehicleEF	MCY	2.7510e-003	3.2530e-003
tblVehicleEF	MCY	0.90	3.86
tblVehicleEF	MCY	0.67	3.56
tblVehicleEF	MCY	0.48	0.00
tblVehicleEF	MCY	2.18	1.02
tblVehicleEF	MCY	0.52	3.76
tblVehicleEF	MCY	1.92	1.31
tblVehicleEF	MCY	2.0780e-003	1.8510e-003
tblVehicleEF	MCY	5.9800e-004	4.6800e-004

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tblVehicleEF	MCY	0.90	0.09
tblVehicleEF	MCY	0.67	3.56
tblVehicleEF	MCY	0.48	0.00
tblVehicleEF	MCY	2.71	1.24
tblVehicleEF	MCY	0.52	3.76
tblVehicleEF	MCY	2.09	1.42
tblVehicleEF	MDV	2.9890e-003	3.3070e-003
tblVehicleEF	MDV	0.06	0.09
tblVehicleEF	MDV	0.72	0.87
tblVehicleEF	MDV	2.79	3.62
tblVehicleEF	MDV	351.34	394.23
tblVehicleEF	MDV	74.92	100.26
tblVehicleEF	MDV	6.9960e-003	7.5830e-003
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	0.06	0.09
tblVehicleEF	MDV	0.26	0.38
tblVehicleEF	MDV	0.04	8.9720e-003
tblVehicleEF	MDV	1.3680e-003	1.3100e-003
tblVehicleEF	MDV	1.7330e-003	2.0690e-003
tblVehicleEF	MDV	0.02	3.1400e-003
tblVehicleEF	MDV	1.2620e-003	1.2070e-003
tblVehicleEF	MDV	1.5940e-003	1.9020e-003
tblVehicleEF	MDV	0.07	0.34
tblVehicleEF	MDV	0.12	0.09
tblVehicleEF	MDV	0.06	0.00
tblVehicleEF	MDV	0.01	0.01
tblVehicleEF	MDV	0.06	0.26
tblVehicleEF	MDV	0.31	0.45
tblVehicleEF	MDV	3.4720e-003	3.8950e-003

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tblVehicleEF	MDV	7.4100e-004	9.9100e-004
tblVehicleEF	MDV	0.07	0.34
tblVehicleEF	MDV	0.12	0.09
tblVehicleEF	MDV	0.06	0.00
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.06	0.26
tblVehicleEF	MDV	0.34	0.49
tblVehicleEF	MH	8.5740e-003	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	0.80	1.11
tblVehicleEF	MH	1.94	2.37
tblVehicleEF	MH	1,472.19	1,680.13
tblVehicleEF	MH	17.63	22.07
tblVehicleEF	MH	0.06	0.07
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.26	1.49
tblVehicleEF	MH	0.24	0.30
tblVehicleEF	MH	0.13	0.04
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	2.5000e-004	2.9600e-004
tblVehicleEF	MH	0.06	0.02
tblVehicleEF	MH	3.2830e-003	3.3090e-003
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	2.3000e-004	2.7200e-004
tblVehicleEF	MH	0.58	30.56
tblVehicleEF	MH	0.05	7.99
tblVehicleEF	MH	0.21	0.00
tblVehicleEF	MH	0.06	0.08

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tblVehicleEF	MH	0.01	0.19
tblVehicleEF	MH	0.09	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	1.7400e-004	2.1800e-004
tblVehicleEF	MH	0.58	30.56
tblVehicleEF	MH	0.05	7.99
tblVehicleEF	MH	0.21	0.00
tblVehicleEF	MH	0.08	0.10
tblVehicleEF	MH	0.01	0.19
tblVehicleEF	MH	0.10	0.12
tblVehicleEF	MHD	3.6170e-003	0.01
tblVehicleEF	MHD	1.5120e-003	9.5360e-003
tblVehicleEF	MHD	8.8700e-003	8.3140e-003
tblVehicleEF	MHD	0.39	0.67
tblVehicleEF	MHD	0.21	0.30
tblVehicleEF	MHD	1.02	1.00
tblVehicleEF	MHD	70.85	158.59
tblVehicleEF	MHD	1,065.91	1,213.65
tblVehicleEF	MHD	8.98	8.21
tblVehicleEF	MHD	0.01	0.02
tblVehicleEF	MHD	0.14	0.16
tblVehicleEF	MHD	7.2880e-003	5.8580e-003
tblVehicleEF	MHD	0.40	0.85
tblVehicleEF	MHD	1.45	1.01
tblVehicleEF	MHD	1.70	1.40
tblVehicleEF	MHD	3.2300e-004	1.7620e-003
tblVehicleEF	MHD	0.13	0.05
tblVehicleEF	MHD	7.0640e-003	0.01
tblVehicleEF	MHD	1.1300e-004	1.0100e-004

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tblVehicleEF	MHD	3.0900e-004	1.6850e-003
tblVehicleEF	MHD	0.06	0.02
tblVehicleEF	MHD	6.7520e-003	0.01
tblVehicleEF	MHD	1.0400e-004	9.3000e-005
tblVehicleEF	MHD	3.5500e-004	0.02
tblVehicleEF	MHD	0.02	5.6030e-003
tblVehicleEF	MHD	0.02	0.03
tblVehicleEF	MHD	1.8800e-004	0.00
tblVehicleEF	MHD	0.01	0.03
tblVehicleEF	MHD	0.02	0.05
tblVehicleEF	MHD	0.05	0.05
tblVehicleEF	MHD	6.7200e-004	1.4720e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	8.9000e-005	8.1000e-005
tblVehicleEF	MHD	3.5500e-004	0.02
tblVehicleEF	MHD	0.02	5.6030e-003
tblVehicleEF	MHD	0.02	0.04
tblVehicleEF	MHD	1.8800e-004	0.00
tblVehicleEF	MHD	0.02	0.05
tblVehicleEF	MHD	0.02	0.05
tblVehicleEF	MHD	0.05	0.05
tblVehicleEF	OBUS	7.0670e-003	7.5140e-003
tblVehicleEF	OBUS	3.3170e-003	9.5930e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.60	0.52
tblVehicleEF	OBUS	0.39	0.44
tblVehicleEF	OBUS	1.79	1.87
tblVehicleEF	OBUS	94.25	87.04
tblVehicleEF	OBUS	1,303.83	1,366.10

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tblVehicleEF	OBUS	14.82	14.86
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.13	0.16
tblVehicleEF	OBUS	0.02	0.01
tblVehicleEF	OBUS	0.39	0.36
tblVehicleEF	OBUS	1.46	0.97
tblVehicleEF	OBUS	1.10	0.99
tblVehicleEF	OBUS	1.2700e-004	4.0400e-004
tblVehicleEF	OBUS	0.13	0.05
tblVehicleEF	OBUS	7.4740e-003	0.02
tblVehicleEF	OBUS	1.4700e-004	1.3100e-004
tblVehicleEF	OBUS	1.2200e-004	3.8700e-004
tblVehicleEF	OBUS	0.06	0.02
tblVehicleEF	OBUS	7.1370e-003	0.01
tblVehicleEF	OBUS	1.3500e-004	1.2100e-004
tblVehicleEF	OBUS	1.0870e-003	0.07
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	4.8600e-004	0.00
tblVehicleEF	OBUS	0.02	0.04
tblVehicleEF	OBUS	0.04	0.08
tblVehicleEF	OBUS	0.09	0.09
tblVehicleEF	OBUS	8.9500e-004	8.2300e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	1.0870e-003	0.07
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.06	0.05
tblVehicleEF	OBUS	4.8600e-004	0.00
tblVehicleEF	OBUS	0.03	0.06

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tblVehicleEF	OBUS	0.04	0.08
tblVehicleEF	OBUS	0.09	0.10
tblVehicleEF	SBUS	0.06	0.08
tblVehicleEF	SBUS	5.7290e-003	0.09
tblVehicleEF	SBUS	5.1560e-003	4.8980e-003
tblVehicleEF	SBUS	2.37	1.69
tblVehicleEF	SBUS	0.47	0.86
tblVehicleEF	SBUS	0.74	0.67
tblVehicleEF	SBUS	345.98	189.05
tblVehicleEF	SBUS	1,037.30	1,017.84
tblVehicleEF	SBUS	4.26	3.78
tblVehicleEF	SBUS	0.05	0.02
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	5.0100e-003	4.3540e-003
tblVehicleEF	SBUS	3.34	1.34
tblVehicleEF	SBUS	4.41	2.41
tblVehicleEF	SBUS	0.90	0.49
tblVehicleEF	SBUS	3.3290e-003	1.2090e-003
tblVehicleEF	SBUS	0.74	0.04
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	5.1000e-005	4.1000e-005
tblVehicleEF	SBUS	3.1850e-003	1.1550e-003
tblVehicleEF	SBUS	0.32	0.02
tblVehicleEF	SBUS	2.7110e-003	2.6430e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	4.7000e-005	3.8000e-005
tblVehicleEF	SBUS	5.9800e-004	0.03
tblVehicleEF	SBUS	5.7950e-003	7.7750e-003

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tblVehicleEF	SBUS	0.26	0.19
tblVehicleEF	SBUS	2.6700e-004	0.00
tblVehicleEF	SBUS	0.08	0.05
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	3.2940e-003	1.7180e-003
tblVehicleEF	SBUS	9.9090e-003	9.4580e-003
tblVehicleEF	SBUS	4.2000e-005	3.7000e-005
tblVehicleEF	SBUS	5.9800e-004	0.03
tblVehicleEF	SBUS	5.7950e-003	7.7750e-003
tblVehicleEF	SBUS	0.38	0.30
tblVehicleEF	SBUS	2.6700e-004	0.00
tblVehicleEF	SBUS	0.09	0.15
tblVehicleEF	SBUS	0.01	0.02
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	UBUS	1.66	0.50
tblVehicleEF	UBUS	1.6700e-003	3.7330e-003
tblVehicleEF	UBUS	12.57	5.88
tblVehicleEF	UBUS	0.14	0.52
tblVehicleEF	UBUS	1,657.49	1,082.15
tblVehicleEF	UBUS	1.39	3.18
tblVehicleEF	UBUS	0.28	0.17
tblVehicleEF	UBUS	1.1100e-003	6.1420e-003
tblVehicleEF	UBUS	0.71	0.30
tblVehicleEF	UBUS	0.01	0.04
tblVehicleEF	UBUS	0.07	0.12
tblVehicleEF	UBUS	0.03	0.04
tblVehicleEF	UBUS	5.2020e-003	5.6850e-003
tblVehicleEF	UBUS	1.5000e-005	1.2000e-005

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tblVehicleEF	UBUS	0.03	0.04
tblVehicleEF	UBUS	8.3320e-003	0.01
tblVehicleEF	UBUS	4.9760e-003	5.4350e-003
tblVehicleEF	UBUS	1.4000e-005	1.1000e-005
tblVehicleEF	UBUS	2.4000e-005	0.01
tblVehicleEF	UBUS	2.0100e-004	3.7860e-003
tblVehicleEF	UBUS	1.1000e-005	0.00
tblVehicleEF	UBUS	0.02	0.06
tblVehicleEF	UBUS	4.0000e-005	7.9870e-003
tblVehicleEF	UBUS	6.9810e-003	0.01
tblVehicleEF	UBUS	0.01	8.8540e-003
tblVehicleEF	UBUS	1.4000e-005	3.1000e-005
tblVehicleEF	UBUS	2.4000e-005	0.01
tblVehicleEF	UBUS	2.0100e-004	3.7860e-003
tblVehicleEF	UBUS	1.1000e-005	0.00
tblVehicleEF	UBUS	1.70	0.57
tblVehicleEF	UBUS	4.0000e-005	7.9870e-003
tblVehicleEF	UBUS	7.6430e-003	0.01
tblVehicleTrips	ST_TR	4.91	3.80
tblVehicleTrips	ST_TR	42.04	30.80
tblVehicleTrips	SU_TR	4.09	3.16
tblVehicleTrips	SU_TR	20.43	14.97
tblVehicleTrips	WD_TR	5.44	4.21
tblVehicleTrips	WD_TR	44.32	32.47
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	0.78	0.00
tblWoodstoves	NumberNoncatalytic	0.78	0.00
tblWoodstoves	WoodstoveDayYear	14.12	0.00
tblWoodstoves	WoodstoveWoodMass	582.40	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	7.2000e-003	0.0688	0.0879	1.5000e-004	4.2000e-004	3.5000e-003	3.9200e-003	6.0000e-005	3.2200e-003	3.2900e-003	0.0000	13.3239	13.3239	4.3100e-003	0.0000	13.4317
2024	0.2108	0.3775	0.4472	7.7000e-004	0.0000	0.0187	0.0187	0.0000	0.0179	0.0179	0.0000	66.9652	66.9652	0.0120	0.0000	67.2646
2025	0.0500	0.0421	0.0665	1.1000e-004	0.0000	1.8900e-003	1.8900e-003	0.0000	1.8900e-003	1.8900e-003	0.0000	9.3790	9.3790	5.1000e-004	0.0000	9.3917
Maximum	**0.2108**	**0.3775**	**0.4472**	**7.7000e-004**	**4.2000e-004**	**0.0187**	**0.0187**	**6.0000e-005**	**0.0179**	**0.0179**	**0.0000**	**66.9652**	**66.9652**	**0.0120**	**0.0000**	**67.2646**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	2.7700e-003	0.0594	0.1057	1.5000e-004	1.9000e-004	2.5000e-004	4.4000e-004	3.0000e-005	2.5000e-004	2.8000e-004	0.0000	13.3239	13.3239	4.3100e-003	0.0000	13.4317
2024	0.1790	0.2781	0.4899	7.7000e-004	0.0000	1.2300e-003	1.2300e-003	0.0000	1.2300e-003	1.2300e-003	0.0000	66.9651	66.9651	0.0120	0.0000	67.2645
2025	0.0458	0.0389	0.0673	1.1000e-004	0.0000	1.5000e-004	1.5000e-004	0.0000	1.5000e-004	1.5000e-004	0.0000	9.3789	9.3789	5.1000e-004	0.0000	9.3917
Maximum	**0.1790**	**0.2781**	**0.4899**	**7.7000e-004**	**1.9000e-004**	**1.2300e-003**	**1.2300e-003**	**3.0000e-005**	**1.2300e-003**	**1.2300e-003**	**0.0000**	**66.9651**	**66.9651**	**0.0120**	**0.0000**	**67.2645**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**15.10**	**22.90**	**-10.22**	**0.00**	**54.76**	**93.24**	**92.59**	**50.00**	**92.93**	**92.82**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-6-2023**	**12-5-2023**	0.0577	0.0518
2	**12-6-2023**	**3-5-2024**	0.0631	0.0384
3	**3-6-2024**	**6-5-2024**	0.0538	0.0325
4	**6-6-2024**	**9-5-2024**	0.1385	0.1052
5	**9-6-2024**	**12-5-2024**	0.2792	0.2310
6	**12-6-2024**	**3-5-2025**	0.1669	0.1476
		Highest	0.2792	0.2310

2.2 Overall Operational

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Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1456	3.3400e-003	0.2896	2.0000e-005		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	0.4736	0.4736	4.5000e-004	0.0000	0.4850
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	47.8873	47.8873	5.1300e-003	6.2000e-004	48.2009
Mobile	0.1175	0.0784	0.7194	1.5600e-003	0.1460	1.1100e-003	0.1471	0.0364	1.0300e-003	0.0375	0.0000	144.0089	144.0089	8.3900e-003	7.0200e-003	146.3101
Waste						0.0000	0.0000		0.0000	0.0000	3.9705	0.0000	3.9705	0.2347	0.0000	9.8368
Water						0.0000	0.0000		0.0000	0.0000	0.9394	2.8244	3.7638	3.5400e-003	2.0800e-003	4.4719
Total	**0.2631**	**0.0817**	**1.0090**	**1.5800e-003**	**0.1460**	**2.7200e-003**	**0.1487**	**0.0364**	**2.6400e-003**	**0.0391**	**4.9099**	**195.1942**	**200.1041**	**0.2522**	**9.7200e-003**	**209.3046**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1456	3.3400e-003	0.2896	2.0000e-005		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	0.4736	0.4736	4.5000e-004	0.0000	0.4850
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	47.8873	47.8873	5.1300e-003	6.2000e-004	48.2009
Mobile	0.1175	0.0784	0.7194	1.5600e-003	0.1460	1.1100e-003	0.1471	0.0364	1.0300e-003	0.0375	0.0000	144.0089	144.0089	8.3900e-003	7.0200e-003	146.3101
Waste						0.0000	0.0000		0.0000	0.0000	3.9705	0.0000	3.9705	0.2347	0.0000	9.8368

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Water						0.0000	0.0000		0.0000	0.0000	0.9394	2.8244	3.7638	3.5400e-003	2.0800e-003	4.4719
Total	**0.2631**	**0.0817**	**1.0090**	**1.5800e-003**	**0.1460**	**2.7200e-003**	**0.1487**	**0.0364**	**2.6400e-003**	**0.0391**	**4.9099**	**195.1942**	**200.1041**	**0.2522**	**9.7200e-003**	**209.3046**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/6/2023	9/6/2023	5	1	
2	Grading	Grading	9/8/2023	11/8/2023	5	44	
3	Trenching	Trenching	11/9/2023	4/30/2024	5	124	
4	Building Construction	Building Construction	5/10/2024	12/24/2024	5	163	
5	Architectural Coating	Architectural Coating	8/1/2024	2/10/2025	5	138	
6	Paving	Paving	11/1/2024	12/10/2024	5	28	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 56,417; Residential Outdoor: 18,806; Non-Residential Indoor: 2,310; Non-Residential Outdoor: 770; Striped Parking Area: 1,176

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	0	0.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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Grading	Bore/Drill Rigs	1	0.90	221	0.50
Grading	Excavators	1	2.70	158	0.38
Grading	Graders	0	0.00	187	0.41
Grading	Rubber Tired Dozers	0	0.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Trenching	Cranes	1	1.30	231	0.29
Trenching	Forklifts	2	5.20	89	0.20
Building Construction	Cranes	1	2.00	231	0.29
Building Construction	Forklifts	1	5.30	89	0.20
Building Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction	Welders	1	0.20	46	0.45
Architectural Coating	Air Compressors	4	3.80	78	0.48
Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Concrete/Industrial Saws	1	0.70	81	0.73
Paving	Pavers	1	0.60	130	0.42
Paving	Paving Equipment	1	0.60	132	0.36
Paving	Rollers	1	0.60	80	0.38
Paving	Tractors/Loaders/Backhoes	2	0.90	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

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3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-005	7.7000e-004	1.1200e-003	0.0000		4.0000e-005	4.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.1368	0.1368	4.0000e-005	0.0000	0.1379
Total	**8.0000e-005**	**7.7000e-004**	**1.1200e-003**	**0.0000**	**0.0000**	**4.0000e-005**	**4.0000e-005**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.1368**	**0.1368**	**4.0000e-005**	**0.0000**	**0.1379**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-005	6.8000e-004	1.1700e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.1368	0.1368	4.0000e-005	0.0000	0.1379
Total	**3.0000e-005**	**6.8000e-004**	**1.1700e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.1368**	**0.1368**	**4.0000e-005**	**0.0000**	**0.1379**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.2000e-004	0.0000	4.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6000e-003	0.0334	0.0538	1.0000e-004		1.5600e-003	1.5600e-003		1.4400e-003	1.4400e-003	0.0000	8.4334	8.4334	2.7300e-003	0.0000	8.5016
Total	**3.6000e-003**	**0.0334**	**0.0538**	**1.0000e-004**	**4.2000e-004**	**1.5600e-003**	**1.9800e-003**	**6.0000e-005**	**1.4400e-003**	**1.5000e-003**	**0.0000**	**8.4334**	**8.4334**	**2.7300e-003**	**0.0000**	**8.5016**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.9000e-004	0.0000	1.9000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6200e-003	0.0380	0.0674	1.0000e-004		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	8.4334	8.4334	2.7300e-003	0.0000	8.5016
Total	**1.6200e-003**	**0.0380**	**0.0674**	**1.0000e-004**	**1.9000e-004**	**1.6000e-004**	**3.5000e-004**	**3.0000e-005**	**1.6000e-004**	**1.9000e-004**	**0.0000**	**8.4334**	**8.4334**	**2.7300e-003**	**0.0000**	**8.5016**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Trenching - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.5200e-003	0.0346	0.0331	5.0000e-005		1.9100e-003	1.9100e-003		1.7500e-003	1.7500e-003	0.0000	4.7537	4.7537	1.5400e-003	0.0000	4.7922
Total	**3.5200e-003**	**0.0346**	**0.0331**	**5.0000e-005**		**1.9100e-003**	**1.9100e-003**		**1.7500e-003**	**1.7500e-003**	**0.0000**	**4.7537**	**4.7537**	**1.5400e-003**	**0.0000**	**4.7922**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1100e-003	0.0207	0.0372	5.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	4.7537	4.7537	1.5400e-003	0.0000	4.7922
Total	**1.1100e-003**	**0.0207**	**0.0372**	**5.0000e-005**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**4.7537**	**4.7537**	**1.5400e-003**	**0.0000**	**4.7922**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.6700e-003	0.0747	0.0770	1.3000e-004		3.9200e-003	3.9200e-003		3.6000e-003	3.6000e-003	0.0000	11.1776	11.1776	3.6200e-003	0.0000	11.2680
Total	**7.6700e-003**	**0.0747**	**0.0770**	**1.3000e-004**		**3.9200e-003**	**3.9200e-003**		**3.6000e-003**	**3.6000e-003**	**0.0000**	**11.1776**	**11.1776**	**3.6200e-003**	**0.0000**	**11.2680**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6200e-003	0.0488	0.0874	1.3000e-004		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	11.1776	11.1776	3.6200e-003	0.0000	11.2680
Total	**2.6200e-003**	**0.0488**	**0.0874**	**1.3000e-004**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**	**0.0000**	**11.1776**	**11.1776**	**3.6200e-003**	**0.0000**	**11.2680**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Building Construction - 2024

Unmitigated Construction On-Site

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0123	0.1219	0.1011	2.1000e-004		5.8200e-003	5.8200e-003		5.3600e-003	5.3600e-003	0.0000	17.9633	17.9633	5.7200e-003	0.0000	18.1064
Total	**0.0123**	**0.1219**	**0.1011**	**2.1000e-004**		**5.8200e-003**	**5.8200e-003**		**5.3600e-003**	**5.3600e-003**	**0.0000**	**17.9633**	**17.9633**	**5.7200e-003**	**0.0000**	**18.1064**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8800e-003	0.0707	0.1284	2.1000e-004		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	17.9633	17.9633	5.7200e-003	0.0000	18.1064
Total	**3.8800e-003**	**0.0707**	**0.1284**	**2.1000e-004**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**	**0.0000**	**17.9633**	**17.9633**	**5.7200e-003**	**0.0000**	**18.1064**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category	tons/yr										MT/yr					
Archit. Coating	0.1645					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0250	0.1683	0.2499	4.1000e-004		8.4100e-003	8.4100e-003		8.4100e-003	8.4100e-003	0.0000	35.2519	35.2519	1.9800e-003	0.0000	35.3016
Total	**0.1894**	**0.1683**	**0.2499**	**4.1000e-004**		**8.4100e-003**	**8.4100e-003**		**8.4100e-003**	**8.4100e-003**	**0.0000**	**35.2519**	**35.2519**	**1.9800e-003**	**0.0000**	**35.3016**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category	tons/yr										MT/yr					
Archit. Coating	0.1645					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5200e-003	0.1463	0.2530	4.1000e-004		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	35.2519	35.2519	1.9800e-003	0.0000	35.3015
Total	**0.1720**	**0.1463**	**0.2530**	**4.1000e-004**		**5.5000e-004**	**5.5000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**35.2519**	**35.2519**	**1.9800e-003**	**0.0000**	**35.3015**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category	tons/yr										MT/yr					
Archit. Coating	0.0438					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.2800e-003	0.0421	0.0665	1.1000e-004		1.8900e-003	1.8900e-003		1.8900e-003	1.8900e-003	0.0000	9.3790	9.3790	5.1000e-004	0.0000	9.3917
Total	**0.0500**	**0.0421**	**0.0665**	**1.1000e-004**		**1.8900e-003**	**1.8900e-003**		**1.8900e-003**	**1.8900e-003**	**0.0000**	**9.3790**	**9.3790**	**5.1000e-004**	**0.0000**	**9.3917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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Category	tons/yr										MT/yr					
Archit. Coating	0.0438					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-003	0.0389	0.0673	1.1000e-004		1.5000e-004	1.5000e-004		1.5000e-004	1.5000e-004	0.0000	9.3789	9.3789	5.1000e-004	0.0000	9.3917
Total	**0.0458**	**0.0389**	**0.0673**	**1.1000e-004**		**1.5000e-004**	**1.5000e-004**		**1.5000e-004**	**1.5000e-004**	**0.0000**	**9.3789**	**9.3789**	**5.1000e-004**	**0.0000**	**9.3917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category	tons/yr										MT/yr					
Off-Road	1.3600e-003	0.0125	0.0192	3.0000e-005		5.9000e-004	5.9000e-004		5.5000e-004	5.5000e-004	0.0000	2.5724	2.5724	6.5000e-004	0.0000	2.5886
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3600e-003**	**0.0125**	**0.0192**	**3.0000e-005**		**5.9000e-004**	**5.9000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.5724**	**2.5724**	**6.5000e-004**	**0.0000**	**2.5886**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category	tons/yr										MT/yr					
Off-Road	5.4000e-004	0.0123	0.0212	3.0000e-005		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	2.5724	2.5724	6.5000e-004	0.0000	2.5886
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.4000e-004**	**0.0123**	**0.0212**	**3.0000e-005**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**2.5724**	**2.5724**	**6.5000e-004**	**0.0000**	**2.5886**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1175	0.0784	0.7194	1.5600e-003	0.1460	1.1100e-003	0.1471	0.0364	1.0300e-003	0.0375	0.0000	144.0089	144.0089	8.3900e-003	7.0200e-003	146.3101
Unmitigated	0.1175	0.0784	0.7194	1.5600e-003	0.1460	1.1100e-003	0.1471	0.0364	1.0300e-003	0.0375	0.0000	144.0089	144.0089	8.3900e-003	7.0200e-003	146.3101

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	164.19	148.20	123.24	360,427	360,427
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Strip Mall	50.00	47.43	23.05	70,513	70,513
Total	214.19	195.63	146.29	430,940	430,940

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.528224	0.040364	0.230108	0.128589	0.023276	0.005740	0.009425	0.007440	0.001057	0.000413	0.022096	0.000684	0.002585

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Enclosed Parking with Elevator	0.528224	0.040364	0.230108	0.128589	0.023276	0.005740	0.009425	0.007440	0.001057	0.000413	0.022096	0.000684	0.002585
Parking Lot	0.528224	0.040364	0.230108	0.128589	0.023276	0.005740	0.009425	0.007440	0.001057	0.000413	0.022096	0.000684	0.002585
Strip Mall	0.528224	0.040364	0.230108	0.128589	0.023276	0.005740	0.009425	0.007440	0.001057	0.000413	0.022096	0.000684	0.002585

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	47.8873	47.8873	5.1300e-003	6.2000e-004	48.2009
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	47.8873	47.8873	5.1300e-003	6.2000e-004	48.2009
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Strip Mall	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Strip Mall	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

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	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	246592	34.4482	3.6900e-003	4.5000e-004	34.6738
Enclosed Parking with Elevator	77248	10.7913	1.1600e-003	1.4000e-004	10.8620
Parking Lot	1890	0.2640	3.0000e-005	0.0000	0.2658
Strip Mall	17063.2	2.3837	2.6000e-004	3.0000e-005	2.3993
Total		**47.8872**	**5.1400e-003**	**6.2000e-004**	**48.2009**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	246592	34.4482	3.6900e-003	4.5000e-004	34.6738
Enclosed Parking with Elevator	77248	10.7913	1.1600e-003	1.4000e-004	10.8620
Parking Lot	1890	0.2640	3.0000e-005	0.0000	0.2658
Strip Mall	17063.2	2.3837	2.6000e-004	3.0000e-005	2.3993
Total		**47.8872**	**5.1400e-003**	**6.2000e-004**	**48.2009**

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6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1456	3.3400e-003	0.2896	2.0000e-005		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	0.4736	0.4736	4.5000e-004	0.0000	0.4850
Unmitigated	0.1456	3.3400e-003	0.2896	2.0000e-005		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	0.4736	0.4736	4.5000e-004	0.0000	0.4850

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0208					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1161					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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Landscaping	8.7200e-003	3.3400e-003	0.2896	2.0000e-005		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	0.4736	0.4736	4.5000e-004	0.0000	0.4850
Total	**0.1456**	**3.3400e-003**	**0.2896**	**2.0000e-005**		**1.6100e-003**	**1.6100e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**0.4736**	**0.4736**	**4.5000e-004**	**0.0000**	**0.4850**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0208					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1161					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.7200e-003	3.3400e-003	0.2896	2.0000e-005		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	0.4736	0.4736	4.5000e-004	0.0000	0.4850
Total	**0.1456**	**3.3400e-003**	**0.2896**	**2.0000e-005**		**1.6100e-003**	**1.6100e-003**		**1.6100e-003**	**1.6100e-003**	**0.0000**	**0.4736**	**0.4736**	**4.5000e-004**	**0.0000**	**0.4850**

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.7638	3.5400e-003	2.0800e-003	4.4719
Unmitigated	3.7638	3.5400e-003	2.0800e-003	4.4719

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	2.54101 / 1.60194	3.6030	3.3800e-003	1.9900e-003	4.2807
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0.114072 / 0.0699149	0.1608	1.5000e-004	9.0000e-005	0.1912
Total		**3.7638**	**3.5300e-003**	**2.0800e-003**	**4.4719**

Mitigated

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Land Use	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
	Mgal	MT/yr			
Apartments Mid Rise	2.54101 / 1.60194	3.6030	3.3800e-003	1.9900e-003	4.2807
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Strip Mall	0.114072 / 0.0699149	0.1608	1.5000e-004	9.0000e-005	0.1912
Total		**3.7638**	**3.5300e-003**	**2.0800e-003**	**4.4719**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3.9705	0.2347	0.0000	9.8368
Unmitigated	3.9705	0.2347	0.0000	9.8368

8.2 Waste by Land Use

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Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	17.94	3.6417	0.2152	0.0000	9.0221
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	1.62	0.3289	0.0194	0.0000	0.8147
Total		**3.9705**	**0.2347**	**0.0000**	**9.8368**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	17.94	3.6417	0.2152	0.0000	9.0221
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Strip Mall	1.62	0.3289	0.0194	0.0000	0.8147

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Total		**3.9705**	**0.2347**	**0.0000**	**9.8368**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 3: EMFAC2021 Calculations

Summary of Construction Traffic Emissions (EMFAC2021)

Pollutants YEAR	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio- CO2	CH4	N2O	CO2e
					Tons							*Metric Tons*		
Criteria Pollutants														
2023	0.0033	0.0241	0.0410	0.0002	0.0098	0.0017	0.0115	0.0015	0.0007	0.0022	20.7055	0.0013	0.0024	21.4685
2024-2025	0.0108	0.0802	0.1339	0.0007	0.0342	0.0059	0.0401	0.0051	0.0025	0.0076	70.7201	0.0044	0.0084	73.3212
Toxic Air Contaminants (0.5 Mile Trip Length)														
2023	0.0028	0.0053	0.0127	0.00001	0.0004	0.0001	0.0005	0.0001	0.00003	0.0001	1.3484	0.0003	0.0002	1.4212
2024-2025	0.0091	0.0181	0.0420	0.0000	0.0015	0.0002	0.0017	0.0002	0.0001	0.0003	4.5974	0.0010	0.0007	4.8442

CalEEMod Construction Inputs

Phase	CalEEMod WORKER TRIPS	CalEEMod VENDOR TRIPS	Total Worker Trips	Total Vendor Trips	CalEEMod HAULING TRIPS	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class	*Worker VMT*	*Vendor VMT*	*Hauling VMT*
Site Preparation	3	0	3	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	32.4	0	0
Grading	8	0	352	0	925	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	3801.6	0	18500
Trenching	8	0	992	0	430	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	10713.6	0	8600
Building Construction	37	8	6031	1304	112	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	65134.8	9519.2	2240
Architectural Coating	7	0	966	0	0	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	10432.8	0	0
Paving	15	0	420	0	8	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	4536	0	160

Number of Days Per Year					
2023	9/6/23	12/31/23	117	84	
2024/2025	1/1/24	2/10/25	407	291	
			524	**375**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Site Preparation	9/6/2023	9/6/2023	5	1
Grading	9/8/2023	11/8/2023	5	44
Trenching	11/9/2023	4/30/2024	5	124
Building Construction	5/10/2024	12/24/2024	5	163
Architectural Coating	8/1/2024	2/10/2025	5	138
Paving	11/1/2024	12/10/2024	5	28

Category		Mix %	Adj	ROG_DIURN	ROG_HTSK	ROG_IDLEX	ROG_RESTL	ROG_RUNEX	ROG_RUNLS	ROG_STREX	NOX_IDLEX	NOX_RUNEX	NOX_STREX	CO_IDLEX	CO_RUNEX	CO_STREX	SO2_IDLEX	SO2_RUNEX	SO2_STREX	Road Dust PM10	PM10_PM BW	PM10_PM TW	PM10_IDLEX	PM10_RUNEX	PM10_STREX	Road Dust PM25	PM25_PM BW	PM25_PM TW	PM25_IDLEX	PM25_RUNEX	PM25_STREX	CO2_NBIO_IDLEX	CO2_NBIO_RUNEX	CO2_NBIO_STREX	CH4_IDLEX	CH4_RUNEX	CH4_STREX	N2O_IDLEX	N2O_RUNEX	N2O_STREX
																														19	22	23	8	9	10						
Hauling	HHDT	100.0	1	0.000287604	8.55424E-05	0.332404817	0	0.01953334	0.00077057	5.28839E-07	4.1629787	1.930480649	2.692504026	5.211988	0.79481483	0.000555	0.00746083	0.01488345	2.65981E-07		0.081444	0.035123	0.002283	0.025833	9.98684E-07		0.028506	0.008781	0.002179	0.0247116	9.183E-07	850.51039	1643.0479	0.0269048	0.235881	0.125647179	9.74075E-08	0.136898	0.262148415	2.46823E-05
	MHD	0.0	0	0.028424515	0.006961572	0.027529656	0	0.04434978	0.05660825	0.052337336	0.9240436	1.219274528	1.396113281	0.673566	0.40377012	1.152494	0.00150213	0.011767743	8.73526E-05	0.299	0.045469	0.012	0.002542	0.014931	0.000112942	0.04499	0.015914	0.003	0.002431	0.0142769	0.0001038	161.33734	1239.5984	8.8359741	0.012943	0.009906777	0.009245497	0.024829	0.159885109	0.006096523
Vendor	HHDT	50.0	0.5	0.000143802	4.27712E-05	0.166202408	0	0.00976667	0.00038529	2.6442E-07	2.0814893	0.965240325	1.346252013	2.605994	0.39740742	0.000277	0.00373041	0.007441725	1.32991E-07		0.040722	0.017561	0.001142	0.012916	4.99342E-07		0.014253	0.00439	0.001089	0.0123558	4.591E-07	425.2552	821.52395	0.0134524	0.11794	0.06282359	4.87037E-08	0.068449	0.131074208	1.23411E-05
	MHD	50.0	0.5	0.014212257	0.003480786	0.013764828	0	0.02217489	0.02830413	0.026168668	0.4620218	0.609637264	0.698056641	0.336783	0.20188506	0.576247	0.00075106	0.005883871	4.36763E-05		0.022735	0.006	0.001271	0.007465	5.64711E-05		0.007957	0.0015	0.001216	0.0071384	5.192E-05	80.66867	619.79918	4.417987	0.006471	0.004953388	0.004622749	0.012414	0.079942554	0.003048262
		1		0.01435606	0.003523557	0.179967236	0	0.03194156	0.02868941	0.026168932	2.5435111	1.574877589	2.044308654	2.942777	0.59929248	0.576524	0.00448148	0.013325596	4.38093E-05	0.299	0.063457	0.023561	0.002413	0.020382	5.69705E-05	0.04499	0.02221	0.00589	0.002305	0.0194942	5.238E-05	505.92387	1441.3231	4.4314394	0.124412	0.067776978	0.004622797	0.080863	0.211016762	0.003060603
Worker	LDA	50.0	0.5	0.143306127	0.042683769	0	0	0.0045285	0.10768412	0.159592017	0	0.021192179	0.122461753	0	0.35031163	1.546631	0	0.001247244	0.00032278		0.0036	0.004	0	0.000614	0.000990927		0.00126	0.001	0	0.0005655	0.0009111	0	126.17319	32.650143	0	0.001154545	0.034539145	0	0.00224937	0.015441065
	LDT1	25.0	0.25	0.156677436	0.04332923	0	0	0.0077825	0.12516577	0.145126689	0	0.035722679	0.100614187	0	0.38639467	1.408382	0	0.000818289	0.000217331		0.002307	0.002	0	0.000514	0.000767762		0.000807	0.0005	0	0.0004735	0.000706	0	82.773349	21.983712	0	0.00173807	0.028010471	0	0.00255413	0.009913954
	LDT2	25.0	0.25	0.074138692	0.021036563	0	0	0.00307324	0.05534742	0.101569939	0	0.019062039	0.088569484	0	0.22117906	0.96209	0	0.000853405	0.000219425		0.002219	0.002	0	0.000345	0.000540097		0.000777	0.0005	0	0.0003173	0.0004966	0	86.33608	22.19552	0	0.000769908	0.021709383	0	0.001616766	0.009562758
			1	0.374122256	0.107049562	0	0	0.015382	0.28819731	0.406288645	0	0.075976897	0.311645425	0	0.95808537	3.917103	0	0.002918938	0.000759537	0.299	0.008126	0.008	0	0.001473	0.002298785	0.04499	0.002844	0.002	0	0.0013563	0.0021137	0	295.28262	76.829375	0	0.003662524	0.084258998	0	0.006420266	0.034917777

Category		Mix %	Adj	ROG_DIURN	ROG_HTSK	ROG_IDLEX	ROG_RESTL	ROG_RUNEX	ROG_RUNLS	ROG_STREX	NOX_IDLEX	NOX_RUNEX	NOX_STREX	CO_IDLEX	CO_RUNEX	CO_STREX	SO2_IDLEX	SO2_RUNEX	SO2_STREX	Road Dust PM10	PM10_PM BW	PM10_PM TW	PM10_IDLEX	PM10_RUNEX	PM10_STREX	Road Dust PM25	PM25_PM BW	PM25_PM TW	PM25_IDLEX	PM25_RUNEX	PM25_STREX	CO2_NBIO_IDLEX	CO2_NBIO_RUNEX	CO2_NBIO_STREX	CH4_IDLEX	CH4_RUNEX	CH4_STREX	N2O_IDLEX	N2O_RUNEX	N2O_STREX
																														19	22	23	8	9	10						
Hauling	HHDT	100.0	1	0.000195977	5.82846E-05	0.329789936	0	0.01860554	0.00052501	4.36152E-07	4.075118	1.850604526	2.731408381	5.19556	0.77488683	0.000626	0.00728035	0.014635772	1.93499E-07		0.081298	0.035125	0.002182	0.025474	6.09682E-07		0.028454	0.008781	0.002082	0.0243688	5.606E-07	832.31669	1617.1297	0.019573	0.232934	0.121678903	8.02769E-08	0.134072	0.258076714	1.94763E-05
	MHD	0.0	0	0.025794994	0.006259754	0.026359118	0	0.03811329	0.05096401	0.04894298	0.8928585	1.112921974	1.40789614	0.671381	0.34617278	1.07433	0.00148998	0.011664295	8.43209E-05	0.299	0.045399	0.012	0.002128	0.012985	0.000106814	0.04499	0.01589	0.003	0.002035	0.0124151	9.821E-05	160.25985	1229.1806	8.5293121	0.013383	0.009658327	0.008772715	0.024689	0.158249654	0.006031915
Vendor	HHDT	50.0	0.5	9.79886E-05	2.91423E-05	0.164894968	0	0.00930277	0.0002625	2.18076E-07	2.037559	0.925302263	1.36570419	2.59778	0.38744341	0.000313	0.00364017	0.007317886	9.67497E-08		0.040649	0.017563	0.001091	0.012737	3.04841E-07		0.014227	0.004391	0.001041	0.0121844	2.803E-07	416.15835	808.56485	0.0097865	0.116467	0.060839451	4.01385E-08	0.067036	0.129038357	9.73817E-06
	MHD	50.0	0.5	0.012897497	0.003129877	0.013179559	0	0.01905664	0.02548201	0.02447149	0.4464293	0.556460987	0.70394807	0.335691	0.17308639	0.537165	0.00074499	0.005832147	4.21605E-05		0.0227	0.006	0.001064	0.006492	5.3407E-05		0.007945	0.0015	0.001018	0.0062075	4.911E-05	80.129824	614.5903	4.2646561	0.006691	0.004829164	0.004386358	0.012344	0.079124827	0.003015958
			1	0.012995486	0.003159019	0.178074527	0	0.02835941	0.02574451	0.024471708	2.4839883	1.48176325	2.06965226	2.933471	0.56052298	0.537478	0.00438516	0.013150033	4.22572E-05	0.299	0.063348	0.023563	0.002155	0.01923	5.37119E-05	0.04499	0.022172	0.005891	0.002059	0.0183919	4.939E-05	496.28827	1423.1552	4.2744426	0.123158	0.065668615	0.004386398	0.07938	0.208163184	0.003025696
Worker	LDA	50.0	0.5	0.136796864	0.040510207	0	0	0.00394285	0.10236849	0.147535756	0	0.018684555	0.115476587	0	0.32486778	1.445873	0	0.001211349	0.000313927		0.003584	0.004	0	0.000585	0.000954881		0.001254	0.001	0	0.000539	0.000878	0	122.54122	31.754603	0	0.001026569	0.03235985	0	0.002080964	0.014940319
	LDT1	25.0	0.25	0.148814258	0.041105424	0	0	0.00690435	0.11745495	0.134116008	0	0.0319581	0.094816504	0	0.35468197	1.306204	0	0.000804162	0.00021249		0.002306	0.002	0	0.000482	0.00072446		0.000807	0.0005	0	0.0004435	0.0006661	0	81.34419	21.494004	0	0.001555571	0.026204278	0	0.002343639	0.009623613
	LDT2	25.0	0.25	0.072043204	0.020150051	0	0	0.00277508	0.05338915	0.094795741	0	0.017007912	0.082407943	0	0.2073341	0.905899	0	0.000831592	0.000213499		0.002217	0.002	0	0.000333	0.000526973		0.000776	0.0005	0	0.0003065	0.0004845	0	84.129497	21.596069	0	0.000704556	0.020482149	0	0.001504103	0.009197602
			1	0.357654326	0.101765681	0	0	0.01362228	0.2734126	0.376447505	0	0.067650567	0.292701033	0	0.88688386	3.657977	0	0.002847102	0.000739916	0.299	0.008107	0.008	0	0.001401	0.002206314	0.04499	0.002837	0.002	0	0.001289	0.0020286	0	288.01491	74.844675	0	0.003286696	0.079046277	0	0.005928705	0.033761535

CalEEMod EMFAC2021 Emission Factors Input — Year 2025

Season	EmissionType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
A	CH4_IDLEX	0	0	0	0	0.005194	0.003023	0.013842	0.229861003	0.007514	0	0	0.076044	0
A	CH4_RUNEX	0.001841	0.005577	0.002592	0.003307	0.007222	0.006455	0.009536	0.117132109	0.009593	0.497756349	0.158292	0.090769	0.011159
A	CH4_STREX	0.060617	0.097956	0.077312	0.090898	0.021636	0.011648	0.008314	7.74759E-08	0.016852	0.003733046	0.177199	0.004898	0.025922
A	CO_IDLEX	0	0	0	0	0.195049	0.141036	0.668176	5.176290252	0.524506	0	0	1.692209	0
A	CO_RUNEX	0.606604	1.307107	0.781421	0.865797	0.821777	0.532869	0.296939	0.756535609	0.44406	5.878094388	12.31202	0.85843	1.105311
A	CO_STREX	2.711494	4.855262	3.417927	3.621729	2.164208	1.195973	1.000247	0.000684691	1.872658	0.515229574	7.965438	0.66885	2.373596
A	CO2_NBIO_IDLEX	0	0	0	0	8.602925	13.6884	158.593	813.9732577	87.04447	0	0	189.0522	0
A	CO2_NBIO_RUNEX	237.6743	319.1813	327.6236	394.2305	764.972	810.9955	1213.655	1586.833625	1366.1	1082.148951	187.2679	1017.838	1680.132
A	CO2_NBIO_STREX	61.73081	84.00027	84.00689	100.2571	17.59535	9.640849	8.205073	0.017114195	14.85767	3.177121883	47.30784	3.779827	22.06858
A	NOX_IDLEX	0	0	0	0	0.046413	0.089605	0.847928	3.965211308	0.364367	0	0	1.342517	0
A	NOX_RUNEX	0.033383	0.114688	0.061427	0.085138	0.585978	0.806102	1.006394	1.774057666	0.968278	0.301158242	0.557882	2.407715	1.487818
A	NOX_STREX	0.218516	0.357478	0.309231	0.377914	0.420652	0.228874	1.403485	2.751173324	0.987981	0.039008099	0.129146	0.492123	0.298831
A	PM10_IDLEX	0	0	0	0	0.000685	0.001389	0.001762	0.002096665	0.000404	0	0	0.001209	0
A	PM10_PMBW	0.007137	0.009219	0.00886	0.008972	0.077556	0.090487	0.04526	0.081222471	0.04982	0.123663808	0.012	0.044786	0.044946
A	PM10_PMTW	0.008	0.008	0.008	0.008	0.00942	0.010665	0.012	0.035128275	0.012	0.042521858	0.004	0.010572	0.013235
A	PM10_RUNEX	0.00112	0.001813	0.001292	0.00131	0.01302	0.021567	0.011186	0.025031341	0.015263	0.005684616	0.001925	0.012423	0.028992
A	PM10_STREX	0.001849	0.00275	0.002061	0.002069	0.000206	9.12E-05	0.000101	5.20395E-07	0.000131	1.2108E-05	0.003464	4.08E-05	0.000296
A	PM25_IDLEX	0	0	0	0	0.000656	0.001329	0.001685	0.001999711	0.000387	0	0	0.001155	0
A	PM25_PMBW	0.002498	0.003227	0.003101	0.00314	0.027145	0.03167	0.015841	0.028427865	0.017437	0.043282333	0.0042	0.015675	0.015731
A	PM25_PMTW	0.002	0.002	0.002	0.002	0.002355	0.002666	0.003	0.008782069	0.003	0.010630465	0.001	0.002643	0.003309
A	PM25_RUNEX	0.001031	0.001669	0.001189	0.001207	0.012419	0.020616	0.010694	0.023944936	0.014593	0.005434911	0.001799	0.01187	0.027693
A	PM25_STREX	0.0017	0.002528	0.001895	0.001902	0.000189	8.39E-05	9.28E-05	4.78484E-07	0.000121	1.11329E-05	0.003253	3.76E-05	0.000272
A	ROG_DIURN	0.264632	0.562584	0.283569	0.336782	0.120201	0.063181	0.023118	0.000161301	0.068202	0.010220489	3.860886	0.029457	30.55965
A	ROG_HTSK	0.077597	0.155938	0.078131	0.089235	0.030304	0.015991	0.005603	4.7964E-05	0.016021	0.003785535	3.558651	0.007775	7.988502
A	ROG_IDLEX	0	0	0	0	0.021187	0.015503	0.025251	0.32711902	0.04025	0	0	0.185349	0
A	ROG_RESTL	0	0	0	0	0	0	0	0	0	0	0	0	0
A	ROG_RUNEX	0.006942	0.024558	0.010089	0.013778	0.079612	0.109106	0.032483	0.017799596	0.044456	0.059943987	1.024683	0.053481	0.077128
A	ROG_RUNLS	0.197921	0.439329	0.211003	0.255197	0.16959	0.087065	0.045291	0.000432041	0.075038	0.007986552	3.760078	0.019152	0.188623
A	ROG_STREX	0.273326	0.495732	0.354505	0.447416	0.106693	0.056928	0.045776	4.20633E-07	0.089311	0.013239776	1.305157	0.027862	0.108247
A	SO2_IDLEX	0	0	0	0	8.37E-05	0.000131	0.001472	0.007098942	0.000823	0	0	0.001718	0
A	SO2_RUNEX	0.002349	0.003155	0.003238	0.003895	0.007471	0.007812	0.011512	0.014348163	0.013043	0.00885381	0.001851	0.009458	0.016473
A	SO2_STREX	0.00061	0.00083	0.00083	0.000991	0.000174	9.53E-05	8.11E-05	1.69191E-07	0.000147	3.14091E-05	0.000468	3.74E-05	0.000218
A	TOG_DIURN	0.264632	0.562584	0.283569	0.336782	0.120201	0.063181	0.023118	0.000161301	0.068202	0.010220489	0.08531	0.029457	30.55965
A	TOG_HTSK	0.077597	0.155938	0.078131	0.089235	0.030304	0.015991	0.005603	4.7964E-05	0.016021	0.003785535	3.558651	0.007775	7.988502
A	TOG_IDLEX	0	0	0	0	0.03005	0.020889	0.042478	0.588143126	0.05333	0	0	0.302207	0
A	TOG_RESTL	0	0	0	0	0	0	0	0	0	0	0	0	0
A	TOG_RUNEX	0.010114	0.035818	0.014707	0.020053	0.097862	0.126808	0.046457	0.137213337	0.060464	0.565677917	1.236542	0.152507	0.100988
A	TOG_RUNLS	0.197921	0.439329	0.211003	0.255197	0.16959	0.087065	0.045291	0.000432041	0.075038	0.007986552	3.760078	0.019152	0.188623
A	TOG_STREX	0.299257	0.542764	0.388138	0.489864	0.116815	0.062329	0.050119	4.6054E-07	0.097784	0.014495888	1.419098	0.030505	0.118517
A	N2O_IDLEX	0	0	0	0	0.000637	0.00168	0.024457	0.131219379	0.012456	0	0	0.024955	0
A	N2O_RUNEX	0.003885	0.008627	0.005647	0.007583	0.040583	0.081593	0.156018	0.253304032	0.157183	0.165902975	0.038984	0.126174	0.069141
A	N2O_STREX	0.028873	0.037292	0.035503	0.037751	0.034174	0.018376	0.005858	1.42154E-05	0.01459	0.006142466	0.007691	0.004354	0.031786

CalEEMod EMFAC2021 Fleet Mix Input — Year 2025

FleetMixLandUseSubType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.528224	0.040364	0.230108	0.128589	0.023276	0.00574	0.009425	0.00744	0.001057	0.000413	0.022096	0.000684	0.002585
Enclosed Parking with Elevator	0.528224	0.040364	0.230108	0.128589	0.023276	0.00574	0.009425	0.00744	0.001057	0.000413	0.022096	0.000684	0.002585
Parking Lot	0.528224	0.040364	0.230108	0.128589	0.023276	0.00574	0.009425	0.00744	0.001057	0.000413	0.022096	0.000684	0.002585
Strip Mall	0.528224	0.040364	0.230108	0.128589	0.023276	0.00574	0.009425	0.00744	0.001057	0.000413	0.022096	0.000684	0.002585

Adjustment Factors

Vehicle Category	Fuel	Population	Pop Fract	VMT (miles/day)	VMT Fract	Trips/day	Trip Fract
HHDT	GAS	2.33035896	1.70966E-05	124.9448223	0.0001166	46.62582199	0.000342
HHDT	DSL	8692.57496	0.06377287	1008963.948	0.9416827	127877.0897	0.938167
HHDT	ELEC	63.3712014	0.000464921	6579.674935	0.0061409	825.9971986	0.00606
HHDT	NG	832.40502	0.00610692	55779.3819	0.0520598	7555.504424	0.055431
		9590.68154		1071447.949		136305.2172	
LDA	GAS	598860.284	0.189163833	22133914.69	0.8620184	2780384.029	0.878248
LDA	DSL	1620.03991	0.000511727	46912.85411	0.001827	6871.193241	0.00217
LDA	ELEC	61443.1924	0.019408249	2670451.983	0.1040023	299852.6978	0.094715
LDA	PIH	19037.6636	0.006013485	825567.7143	0.0321522	78720.73884	0.024866
		680961.18		25676847.24		3165828.659	
LDT1	GAS	51680.8552	0.222992328	1664705.874	0.9915742	230185.983	0.993205
LDT1	DSL	21.282725	9.18306E-05	302.825779	0.0001804	59.13231308	0.000255
LDT1	ELEC	234.457824	0.001011638	9323.703781	0.0055536	1109.79593	0.004789
LDT1	PIH	98.1319848	0.000423419	4519.182281	0.0026918	405.7757571	0.001751
		52034.7277		1678851.586		231760.687	
LDT2	GAS	290874.748	0.209748755	10447705.78	0.9789509	1360240.873	0.980865
LDT2	DSL	1049.95238	0.000757117	38652.33695	0.0036217	4980.340082	0.003591
LDT2	ELEC	2157.05904	0.001555448	73663.77305	0.0069023	10962.38395	0.007905
LDT2	PIH	2561.88514	0.001847366	112327.2154	0.0105251	10593.39505	0.007639
		296643.645		10672349.11		1386776.992	
LHDT1	GAS	19422.4639	0.045941069	728336.977	0.6336476	289365.7727	0.684453
LHDT1	DSL	10387.1028	0.024569211	408019.3319	0.3549737	130656.6864	0.30905
LHDT1	ELEC	196.401964	0.000464561	13079.06139	0.0113787	2746.629156	0.006497
		30005.9687	0.070974841	1149435.37		422769.0882	
LHDT2	GAS	2512.65228	0.025565973	91345.05406	0.3225651	37434.7751	0.380895
LHDT2	DSL	4837.2356	0.049218364	188645.0475	0.6661587	60846.33861	0.619105
LHDT2	ELEC	50.4620201	0.000513446	3193.250687	0.0112763	669.1749743	0.006809
		7400.3499	0.075297782	283183.3523		98281.11371	
MCY	GAS	28484.893	0.022095845	166414.5147	1	56969.78604	1
MDV	GAS	159532.218	0.207432201	5551044.411	0.9605893	739781.3765	0.961903
MDV	DSL	2421.36412	0.003148385	85326.79887	0.0147655	11351.14178	0.014759
MDV	ELEC	2274.54722	0.002957486	77934.95958	0.0134864	11571.05737	0.015045
MDV	PIH	1542.36579	0.002005465	64484.39206	0.0111588	6377.682532	0.008293
		165770.495		5778790.561		769081.2582	
MH	GAS	2337.87649	7.013583236	21506.19156	0.6912933	233.8811638	0.701639
MH	DSL	994.543666	2.983611331	9603.892712	0.3087067	99.45436656	0.298361
		3332.42015		31110.08427		333.3355304	
MHDT	GAS	1412.26257	0.009037553	72039.87357	0.1394582	28256.54946	0.180823
MHDT	DSL	10548.0591	0.067500648	435100.6189	0.8422883	125915.2277	0.805775
MHDT	ELEC	90.8085123	0.000581115	4838.905804	0.0093674	1182.343378	0.007566
MHDT	NG	98.9062774	0.000632935	4590.306874	0.0088861	911.9208312	0.005836
		12150.0365		516569.7051		156266.0414	
OBUS	GAS	430.702276	0.023671729	18962.49127	0.2311741	8617.491144	0.473624
OBUS	DSL	921.411582	0.050641491	62304.88754	0.7595666	9451.527202	0.519463
OBUS	ELEC	2.67203053	0.000146857	221.7710452	0.0027036	53.46198693	0.002938
OBUS	NG	8.1253065	0.000446573	537.746753	0.0065557	72.31522781	0.003975
		1362.9112		82026.89662		18194.79556	
SBUS	GAS	178.243554	0.016385172	8812.851183	0.3543672	712.9742161	0.065541
SBUS	DSL	673.204793	0.061884852	15283.75186	0.6145639	9748.005403	0.896093
SBUS	ELEC	4.48116849	0.000411935	145.0761128	0.0058336	51.24766317	0.004711
SBUS	NG	25.2843935	0.002324287	627.585971	0.0252354	366.1180183	0.033656
		881.213909		24869.26513		10878.3453	
UBUS	GAS	46.2191762	0.021676301	4826.657731	0.0818022	184.8767049	0.086705
UBUS	DSL	405.367492	0.190113029	44987.36567	0.7624463	1621.46997	0.760452
UBUS	ELEC	23.3120232	0.100202165	2427.539875	0.3589751	93.248093	0.400809
UBUS	NG	58.1624738	0.02727758	6762.418158	0.1146095	232.6498951	0.10911
		533.061166		59003.98143		2132.244663	

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_PM	PM2.5_PM	PM10_RUI	PM10_IDL	PM10_STR	PM10_PM	PM10_PM	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTS	ROG_RUNL	ROG_DIUR	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTS	TOG_RUNL	TOG_DIUR	NH3_RUNEX	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Santa Clara	2023	HHDT	Aggregate	Aggregate	Gasoline	3.454009	114.3093	114.3093	0	69.10781	8.107874	0	1.602501	0.00493	0	0.0017	0.005	0.035266	0.005362	0	0.001849	0.02	0.100759	2306.817	0	49.81185	0.340225	0	0.00018	0.208909	0	0.045697	2.104867	0	0.000979	0.158374	1.426645	10.65375	3.071416	0	0.001072	0.158374	1.426645	10.65375	0.040468	83.0074	0	1.02738	0.022805	0	0.000492
Santa Clara	2023	HHDT	Aggregate	Aggregate	Diesel	8235.059	991289	991289	0	120860.8	1.969368	63.40488	2.849455	0.025957	0.031631	0	0.008769	0.027531	0.027131	0.033061	0	0.035077	0.078661	1656.801	12241.32	0	0.000809	0.237446	0	0.26103	1.928625	0	0.017417	5.112156	0	0	0	0	0.019828	5.819801	0	0	0	0	0.214624	0.087393	74.20136	0	0.015689	0.115918	0
Santa Clara	2023	HHDT	Aggregate	Aggregate	Electricity	6.70171	411.5054	0	411.5054	103.2044	0	0	0	0	0	0	0	0	0	0	0	0.03496	0.038238	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2023	HHDT	Aggregate	Aggregate	Natural Ga	753.7366	53295.97	53295.97	0	6914.034	1.208444	13.92832	0	0.001774	0.024237	0	0.009	0.046729	0.001929	0.02636	0	0.036	0.133512	1398.51	10630.2	0	2.44811	37.44665	0	0.285095	2.167036	0	0.054572	0.572265	0	0	0	0	2.520799	38.25947	0	0	0	0	0.860105	13.78246	74.03965	0	0	0	0
Santa Clara	2023	LDA	Aggregate	Aggregate	Gasoline	601938.3	22370251	22370251	0	2795479	0.047412	0	0.27189	0.001217	0	0.001992	0.002	0.002656	0.001323	0	0.002167	0.008	0.007588	281.43	0	71.66478	0.002603	0	0.076449	0.004995	0	0.034134	0.01016	0	0.353794	0.094758	0.240611	1.480552	0.014823	0	0.387359	0.094758	0.240611	1.480552	0.033781	0.787617	0	3.436611	0.002782	0	0.000708
Santa Clara	2023	LDA	Aggregate	Aggregate	Diesel	1871.125	56220.8	56220.8	0	8000.531	0.238318	0	0	0.018559	0	0	0.002	0.002698	0.019399	0	0	0.008	0.007709	234.426	0	0	0.001413	0	0	0.036934	0	0	0.030417	0	0	0	0	0	0.034627	0	0	0	0	0	0.0031	0.342459	0	0	0.002221	0	0
Santa Clara	2023	LDA	Aggregate	Aggregate	Electricity	53751.15	2268185	0	2268185	265250.1	0	0	0	0	0	0	0.002	0.001532	0	0	0	0.008	0.004377	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2023	LDA	Aggregate	Aggregate	Plug-in Hyb	15805.32	700610.9	356649.7	343961.3	65355	0.00334	0	0.11551	0.000664	0	0.002171	0.002	0.001373	0.000722	0	0.002361	0.008	0.003922	142.1102	0	66.08871	0.000457	0	0.042604	0.000605	0	0.020916	0.001444	0	0.173285	0.040642	0.036088	0.447056	0.002108	0	0.189725	0.040642	0.036088	0.447056	0.019705	0.219913	0	1.339893	0.001405	0	0.000653
Santa Clara	2023	LDT1	Aggregate	Aggregate	Gasoline	53782.25	1744480	1744480	0	239737.9	0.143293	0	0.404336	0.00185	0	0.002837	0.002	0.003239	0.002012	0	0.003085	0.008	0.009253	332.6535	0	88.31133	0.006987	0	0.112557	0.010257	0	0.039834	0.031222	0	0.583212	0.174145	0.503091	2.807011	0.045546	0	0.638542	0.174145	0.503091	2.807011	0.035775	1.553409	0	5.660037	0.003289	0	0.000873
Santa Clara	2023	LDT1	Aggregate	Aggregate	Diesel	26.04714	391.8698	391.8698	0	75.17737	1.659056	0	0	0.24041	0	0	0.002	0.003728	0.25128	0	0	0.008	0.010651	415.548	0	0	0.013928	0	0	0.06547	0	0	0.299852	0	0	0	0	0	0.341362	0	0	0	0	0	0.0031	1.601395	0	0	0.003938	0	0
Santa Clara	2023	LDT1	Aggregate	Aggregate	Electricity	194.8941	7068.184	0	7068.184	916.4832	0	0	0	0	0	0	0.002	0.00154	0	0	0	0.008	0.0044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2023	LDT1	Aggregate	Aggregate	Plug-in Hyb	43.27677	2048.369	944.1579	1104.211	178.9495	0.003025	0	0.11551	0.000387	0	0.00141	0.002	0.001383	0.000421	0	0.001534	0.008	0.003951	128.7649	0	70.86641	0.000412	0	0.042439	0.000544	0	0.020762	0.001308	0	0.173285	0.024584	0.021781	0.285922	0.001909	0	0.189725	0.024584	0.021781	0.285922	0.019359	0.199575	0	1.339893	0.001273	0	0.000701
Santa Clara	2023	LDT2	Aggregate	Aggregate	Gasoline	280180.4	10140967	10140967	0	1311796	0.077207	0	0.358346	0.001265	0	0.002003	0.002	0.003125	0.001375	0	0.002179	0.008	0.008929	348.3961	0	89.54446	0.003121	0	0.087759	0.006381	0	0.038646	0.012417	0	0.410727	0.085119	0.224187	1.404898	0.018118	0	0.449694	0.085119	0.224187	1.404898	0.035545	0.896823	0	3.892097	0.003444	0	0.000885
Santa Clara	2023	LDT2	Aggregate	Aggregate	Diesel	978.4967	36936.87	36936.87	0	4673.401	0.046157	0	0	0.005431	0	0	0.002	0.003102	0.005677	0	0	0.008	0.008863	313.0666	0	0	0.00065	0	0	0.049324	0	0	0.013984	0	0	0	0	0	0.015919	0	0	0	0	0	0.0031	0.132099	0	0	0.002966	0	0
Santa Clara	2023	LDT2	Aggregate	Aggregate	Electricity	1105.879	38931.7	0	38931.7	5663.051	0	0	0	0	0	0	0.002	0.001525	0	0	0	0.008	0.004357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2023	LDT2	Aggregate	Aggregate	Plug-in Hyb	1696.55	77270.66	37142.68	40127.98	7015.234	0.003154	0	0.11551	0.000504	0	0.001759	0.002	0.001378	0.000548	0	0.001913	0.008	0.003938	134.2545	0	77.03601	0.000429	0	0.042457	0.000568	0	0.020778	0.001364	0	0.173285	0.02624	0.024448	0.318232	0.00199	0	0.189725	0.02624	0.024448	0.318232	0.020144	0.207985	0	1.339893	0.001327	0	0.000762
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Gasoline	19180.96	711085.5	711085.5	0	285767.8	0.197814	0.037373	0.6588	0.001595	0	0.000328	0.002	0.0273	0.001734	0	0.000356	0.008	0.078	889.7424	120.2664	25.83956	0.009485	0.115635	0.034516	0.011082	0.003012	0.051891	0.047656	0.428153	0.172233	0.050564	0.277601	2.913784	0.069539	0.62476	0.188574	0.050564	0.277601	2.913784	0.044872	1.225109	3.753425	3.080251	0.008796	0.001189	0.000255
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Diesel	9807.465	384084.8	384084.8	0	123365.6	1.780633	2.029274	0	0.038253	0.026974	0	0.003	0.0273	0.039983	0.028193	0	0.012	0.078	635.427	132.908	0	0.008623	0.005098	0	0.100112	0.02094	0	0.185652	0.10976	0	0	0	0	0.211352	0.124954	0	0	0	0	0.16551	0.518876	0.909745	0	0.006021	0.001259	0
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Gasoline	2494.382	90793.04	90793.04	0	37162.58	0.187016	0.036817	0.642061	0.001446	0	0.00026	0.002	0.03185	0.001572	0	0.000283	0.008	0.091	997.3845	138.7974	25.72325	0.007074	0.114568	0.033461	0.01097	0.002967	0.050452	0.033047	0.42203	0.165607	0.046993	0.25097	2.676301	0.048222	0.613826	0.181319	0.046993	0.25097	2.676301	0.044967	0.961891	3.759407	3.119312	0.00986	0.001372	0.000254
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Diesel	4479.532	176769.2	176769.2	0	56346.87	1.416942	1.998258	0	0.034177	0.027026	0	0.003	0.03185	0.035723	0.028248	0	0.012	0.091	764.5039	212.1206	0	0.007824	0.005098	0	0.120448	0.03342	0	0.168448	0.10976	0	0	0	0	0.191767	0.124954	0	0	0	0	0.178982	0.44054	0.909745	0	0.007244	0.00201	0
Santa Clara	2023	MCY	Aggregate	Aggregate	Gasoline	27894.5	164894.5	164894.5	0	55788.99	0.586927	0	0.142374	0.001778	0	0.003413	0.001	0.0042	0.001899	0	0.003626	0.004	0.012	188.3093	0	49.59811	0.167622	0	0.187482	0.040223	0	0.008379	1.105923	0	1.392636	3.5601	3.745685	3.947874	1.324135	0	1.513873	3.5601	3.745685	3.947874	0.00876	13.08956	0	8.051197	0.001862	0	0.00049
Santa Clara	2023	MDV	Aggregate	Aggregate	Gasoline	153799.1	5358084	5358084	0	712433.9	0.11759	0	0.470106	0.001289	0	0.002144	0.002	0.003187	0.001402	0	0.002331	0.008	0.009106	422.6791	0	109.0331	0.004406	0	0.110292	0.008479	0	0.043081	0.018826	0	0.559259	0.101975	0.285798	1.72733	0.02744	0	0.612315	0.101975	0.285798	1.72733	0.035428	1.067328	0	4.333252	0.004179	0	0.001078
Santa Clara	2023	MDV	Aggregate	Aggregate	Diesel	2374.918	86834.44	86834.44	0	11267.05	0.053096	0	0	0.00515	0	0	0.002	0.003181	0.005383	0	0	0.008	0.00909	411.1632	0	0	0.000529	0	0	0.064779	0	0	0.011397	0	0	0	0	0	0.012975	0	0	0	0	0	0.0031	0.202592	0	0	0.003896	0	0
Santa Clara	2023	MDV	Aggregate	Aggregate	Electricity	1130.115	40073.7	0	40073.7	5799.833	0	0	0	0	0	0	0.002	0.001524	0	0	0	0.008	0.004354	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2023	MDV	Aggregate	Aggregate	Plug-in Hyb	986.0895	41899.14	20787.35	21111.79	4077.48	0.003256	0	0.11551	0.000638	0	0.002151	0.002	0.001376	0.000693	0	0.002339	0.008	0.00393	138.532	0	96.68489	0.000441	0	0.042261	0.000581	0	0.020595	0.001408	0	0.173285	0.02985	0.028058	0.359617	0.002054	0	0.189725	0.02985	0.028058	0.359617	0.020837	0.214483	0	1.339893	0.00137	0	0.000956
Santa Clara	2023	MH	Aggregate	Aggregate	Gasoline	2522.745	22546.87	22546.87	0	252.3754	0.479133	0	0.412521	0.001781	0	0.000428	0.003	0.015756	0.001937	0	0.000466	0.012	0.045017	1948.243	0	31.87585	0.018146	0	0.038028	0.02809	0	0.042647	0.082252	0	0.163779	13.03985	0.30297	4.773625	0.120022	0	0.179318	13.03985	0.30297	4.773625	0.044742	2.111943	0	3.629376	0.01926	0	0.000315
Santa Clara	2023	MH	Aggregate	Aggregate	Diesel	959.1578	9344.849	9344.849	0	95.91578	4.269554	0	0	0.097907	0	0	0.004	0.015675	0.102334	0	0	0.016	0.044785	1081.435	0	0	0.005704	0	0	0.17038	0	0	0.122812	0	0	0	0	0	0.139813	0	0	0	0	0	0.150005	0.410284	0	0	0.010247	0	0
Santa Clara	2023	MHDT	Aggregate	Aggregate	Gasoline	1418.703	70785.86	70785.86	0	28385.41	0.562864	0.088304	0.453053	0.001386	0	0.000555	0.003	0.015756	0.001507	0	0.000603	0.012	0.045017	1792.411	536.9661	47.19918	0.018074	0.254589	0.049387	0.026381	0.007064	0.032566	0.09086	1.010025	0.279571	0.037187	0.302385	3.037923	0.132583	1.473826	0.306095	0.037187	0.302385	3.037923	0.04497	1.909686	15.08517	6.156285	0.01772	0.005308	0.000467
Santa Clara	2023	MHDT	Aggregate	Aggregate	Diesel	10273.55	431550.4	431550.4	0	122418.2	1.337342	13.57242	1.624162	0.016518	0.035742	0	0.003	0.015941	0.017265	0.037358	0	0.012	0.045546	1151.562	2263.789	0	0.001721	0.012298	0	0.181429	0.356661	0	0.037048	0.26478	0	0	0	0	0.042176	0.301431	0	0	0	0	0.209014	0.132571	7.583386	0	0.010905	0.021437	0
Santa Clara	2023	MHDT	Aggregate	Aggregate	Electricity	4.749835	101.8022	0	101.8022	59.6458	0	0	0	0	0	0	0.003	0.00799	0	0	0	0.012	0.022828	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2023	MHDT	Aggregate	Aggregate	Natural Ga	83.841	4047.874	4047.874	0	762.81	0.141319	6.52743	0	0.001137	0.017647	0	0.003	0.016002	0.001236	0.019193	0	0.012	0.045721	989.385	5296.533	0	0.740055	17.59163	0	0.201693	1.079733	0	0.010574	0.25135	0	0	0	0	0.755281	17.95355	0	0	0	0	1.06	2.992708	33.64344	0	0	0	0
Santa Clara	2023	OBUS	Aggregate	Aggregate	Gasoline	458.8974	20830.08	20830.08	0	9181.619	0.553081	0.064991	0.405616	0.000893	0	0.000264	0.003	0.01568	0.000972	0	0.000287	0.012	0.044799	1784.092	381.8461	31.89445	0.015808	0.194938	0.036281	0.026177	0.005253	0.030766	0.078109	0.745234	0.192301	0.034706	0.154035	2.766253	0.113977	1.087444	0.210546	0.034706	0.154035	2.766253	0.044918	1.743956	5.768375	4.071703	0.017638	0.003775	0.000315
Santa Clara	2023	OBUS	Aggregate	Aggregate	Diesel	870.4209	61645.66	61645.66	0	8910.755	1.203188	7.410097	1.541404	0.020323	0.008632	0	0.003	0.018018	0.021242	0.009022	0	0.012	0.05148	1282.538	1552.949	0	0.001991	0.020568	0	0.202064	0.244668	0	0.04286	0.442828	0	0	0	0	0.048793	0.504126	0	0	0	0	0.215865	0.153454	7.510858	0	0.012145	0.014706	0
Santa Clara	2023	OBUS	Aggregate	Aggregate	Natural Ga	6.1456	409.5466	409.5466	0	54.69584	0.219315	1.549107	0	0.000923	0.00362	0	0.003	0.016148	0.001004	0.003937	0	0.012	0.046137	1017.405	1188.285	0	0.774069	4.381267	0	0.207405	0.24224	0	0.01106	0.0626	0	0	0	0	0.789994	4.471404	0	0	0	0	1.06	3.211954	6.724204	0	0	0	0
Santa Clara	2023	SBUS	Aggregate	Aggregate	Gasoline	166.9867	8309.308	8309.308	0	667.9468	0.519317	0.925703	0.7051	0.000862	0	0.00056	0.002	0.015721	0.000937	0	0.000609	0.008	0.044917	815.0909	2602.033	58.66947	0.011871	2.46208	0.074918	0.027733	0.086224	0.064904	0.057744	10.62943	0.427061	0.112221	0.259299	1.591441	0.084259	15.51043	0.467578	0.112221	0.259299	1.591441	0.045	1.469507	82.16746	10.56434	0.008058	0.025724	0.00058
Santa Clara	2023	SBUS	Aggregate	Aggregate	Diesel	667.1185	15392.68	15392.68	0	9659.876	4.028015	22.39863	0.467155	0.020908	0.02125	0	0.003	0.015721	0.021853	0.022211	0	0.012	0.044917	1148.524	2237.814	0	0.002748	0.008083	0	0.18095	0.352568	0	0.059161	0.174017	0	0	0	0	0.06735	0.198106	0	0	0	0	0.144154	0.181489	4.581854	0	0.010876	0.021191	0
Santa Clara	2023	SBUS	Aggregate	Aggregate	Electricity	0.302373	3.510494	0	3.510494	4.378365	0	0	0	0	0	0	0.003	0.00786	0	0	0	0.012	0.022459	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2023	SBUS	Aggregate	Aggregate	Natural Ga	23.50762	595.8705	595.8705	0	340.3903	0.587321	5.282702	0	0.003378	0.011076	0	0.003	0.015721	0.003674	0.012046	0	0.012	0.044917	1271.127	4058.811	0	3.490611	15.40242	0	0.259128	0.827415	0	0.049874	0.22007	0	0	0	0	0.362424	15.7193	0	0	0	0	1.06	11.90284	20.11199	0	0	0	0
Santa Clara	2023	UBUS	Aggregate	Aggregate	Gasoline	45.94709	4798.244	4798.244	0	183.7884	0.026807	0	0.443444	0.001143	0	0.000128	0.002	0.03185	0.001243	0	0.00014	0.008	0.091	926.2924	0	36.84613	0.002031	0	0.041715	0.004215	0	0.070149	0.005614	0	0.147842	0.038144	0.09212	0.456803	0.008192	0	0.161868	0.038144	0.09212	0.456803	0.045	0.571128	0	6.073786	0.009157	0	0.000364
Santa Clara	2023	UBUS	Aggregate	Aggregate	Diesel	436.6681	48829.71	48829.71	0	1746.672	0.386256	0	0	0.007022	0	0	0.0083	0.0385	0.00734	0	0	0.0332	0.11	1100.965	0	0	0.003215	0	0	0.173457	0	0	0.065028	0	0	0	0	0	0.078788	0	0	0	0	0	0.18785	0.079368	0	0	0.010432	0	0
Santa Clara	2023	UBUS	Aggregate	Aggregate	Electricity	5.046757	199.0027	0	199.0027	20.18703	0	0	0	0	0	0	0.009	0.01925	0	0	0	0.036	0.055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2023	UBUS	Aggregate	Aggregate	Natural Ga	42.26114	4829.673	4829.673	0	169.0446	0.05878	0	0	0.000282	0	0	0.008182	0.0385	0.000295	0	0	0.032727	0.11	1299.127	0	0	4.245742	0	0	0.264835	0	0	0.060663	0	0	0	0	0	4.333091	0	0	0	0	0	0.97	49.04231	0	0	0	0	0

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2024
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_DIU	PM2.5_TIR	PM10_RUI	PM10_IDL	PM10_STR	PM10_DIU	PM10_TIR	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTS	ROG_RUNL	ROG_DIUR	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTS	TOG_RUNL	TOG_DIUR	NH3_RUNEX	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Santa Clara	2024	HHDT	Aggregate	Aggregate	Gasoline	2.588708	115.1526	115.1526	0	51.79487	7.013725	0	1.695629	0.003612	0	0.001433	0.005	0.03384	0.003929	0	0.001559	0.02	0.096686	2166.164	0	50.04419	0.246012	0	0.000205	0.192927	0	0.049797	1.47824	0	0.001115	0.149022	1.34233	10.02547	2.157045	0	0.001221	0.149022	1.34233	10.02547	0.04274	52.51903	0	1.60109	0.021415	0	0.000495
Santa Clara	2024	HHDT	Aggregate	Aggregate	Diesel	8486.693	1001095	1001095	0	124748.4	1.894567	62.32042	2.898867	0.025674	0.03017	0	0.008877	0.027454	0.026835	0.031534	0	0.035082	0.07844	1634.1	11997.01	0	0.000777	0.23663	0	0.257453	1.890134	0	0.016732	5.094584	0	0	0	0	0.019048	5.799796	0	0	0	0	0	0.215084	0.082524	74.10576	0	0.015474	0.113605	0
Santa Clara	2024	HHDT	Aggregate	Aggregate	Electricity	28.33039	2794.261	0	2794.261	378.7946	0	0	0	0	0	0	0.008585	0.014055	0	0	0	0.034341	0.040158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	HHDT	Aggregate	Aggregate	Natural Ga	794.401	54591.27	54591.27	0	7249.717	1.128254	13.55515	0	0.001724	0.024776	0	0.009	0.047521	0.001875	0.026946	0	0.036	0.135775	1387.534	10583.64	0	2.344742	36.30276	0	0.282858	2.157544	0	0.050833	0.550696	0	0	0	0	0.41272	37.08609	0	0	0	0	0	0.85184	13.40196	74.43135	0	0	0	0
Santa Clara	2024	LDA	Aggregate	Aggregate	Gasoline	600108.2	22290344	22290344	0	2786617	0.042281	0	0.257993	0.001177	0	0.001931	0.002	0.002656	0.00128	0	0.0021	0.008	0.007587	275.9552	0	70.08069	0.002338	0	0.072036	0.004672	0	0.033228	0.008937	0	0.328953	0.090491	0.230394	1.422636	0.013041	0	0.360162	0.090491	0.230394	1.422636	0.034712	0.737516	0	3.233068	0.002728	0	0.000693
Santa Clara	2024	LDA	Aggregate	Aggregate	Diesel	1750.024	51573.48	51573.48	0	7442.61	0.213181	0	0	0.016747	0	0	0.002	0.002706	0.017504	0	0	0.008	0.00773	232.3976	0	0	0.001289	0	0	0.036614	0	0	0.027749	0	0	0	0	0	0.03159	0	0	0	0	0	0.0031	0.331109	0	0	0.002202	0	0
Santa Clara	2024	LDA	Aggregate	Aggregate	Electricity	57627.4	2472767	0	2472767	282733	0	0	0	0	0	0	0.002	0.001533	0	0	0	0.008	0.00438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	LDA	Aggregate	Aggregate	Plug-in Hyb	17457.1	767059.2	381568.7	385490.5	72185.1	0.003264	0	0.11551	0.000618	0	0.00207	0.002	0.001377	0.000672	0	0.002252	0.008	0.003935	138.86	0	65.1247	0.000444	0	0.04244	0.000587	0	0.020762	0.001412	0	0.173285	0.041111	0.037292	0.447104	0.00206	0	0.189725	0.041111	0.037292	0.447104	0.019502	0.214853	0	1.339893	0.001373	0	0.000644
Santa Clara	2024	LDT1	Aggregate	Aggregate	Gasoline	52693.37	1706864	1706864	0	234793.4	0.128357	0	0.381294	0.001737	0	0.002678	0.002	0.00324	0.001889	0	0.002913	0.008	0.009258	327.2571	0	86.38434	0.006261	0	0.105365	0.009424	0	0.03869	0.027741	0	0.539321	0.165332	0.472477	2.667158	0.040475	0	0.590488	0.165332	0.472477	2.667158	0.036079	1.427621	0	5.253053	0.003235	0	0.000854
Santa Clara	2024	LDT1	Aggregate	Aggregate	Diesel	23.46233	343.9308	343.9308	0	66.44459	1.651932	0	0	0.239373	0	0	0.002	0.003724	0.250196	0	0	0.008	0.01064	415.3002	0	0	0.013862	0	0	0.065431	0	0	0.298448	0	0	0	0	0	0.339763	0	0	0	0	0	0.0031	1.593665	0	0	0.003935	0	0
Santa Clara	2024	LDT1	Aggregate	Aggregate	Electricity	211.0028	8008.646	0	8008.646	994.4346	0	0	0	0	0	0	0.002	0.001539	0	0	0	0.008	0.004397	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	LDT1	Aggregate	Aggregate	Plug-in Hyb	67.64578	3164.46	1414.302	1750.158	279.7153	0.002933	0	0.11551	0.000367	0	0.001381	0.002	0.001389	0.0004	0	0.001502	0.008	0.003967	124.8456	0	69.31208	0.000397	0	0.042219	0.000522	0	0.020556	0.001268	0	0.173285	0.024153	0.020965	0.279628	0.001851	0	0.189725	0.024153	0.020965	0.279628	0.018771	0.19347	0	1.339893	0.001234	0	0.000685
Santa Clara	2024	LDT2	Aggregate	Aggregate	Gasoline	285585.4	10322758	10322758	0	1336438	0.069091	0	0.334237	0.001227	0	0.001959	0.002	0.003127	0.001334	0	0.00213	0.008	0.008936	340.3247	0	87.29427	0.002864	0	0.082985	0.005943	0	0.037254	0.011242	0	0.384216	0.081741	0.217688	1.368189	0.016404	0	0.420668	0.081741	0.217688	1.368189	0.036359	0.842122	0	3.673764	0.003364	0	0.000863
Santa Clara	2024	LDT2	Aggregate	Aggregate	Diesel	1015.453	37944.26	37944.26	0	4835.434	0.041515	0	0	0.004813	0	0	0.002	0.003113	0.005031	0	0	0.008	0.008895	307.1615	0	0	0.000609	0	0	0.048393	0	0	0.013105	0	0	0	0	0	0.014919	0	0	0	0	0	0.0031	0.129976	0	0	0.002911	0	0
Santa Clara	2024	LDT2	Aggregate	Aggregate	Electricity	1597.567	55532.59	0	55532.59	8150.927	0	0	0	0	0	0	0.002	0.001526	0	0	0	0.008	0.004359	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	LDT2	Aggregate	Aggregate	Plug-in Hyb	2116.58	94757.71	44376.61	50381.09	8752.056	0.003073	0	0.11551	0.000467	0	0.001672	0.002	0.001383	0.000508	0	0.001819	0.008	0.003953	130.7877	0	75.60584	0.000416	0	0.042233	0.000547	0	0.020569	0.001329	0	0.173285	0.025949	0.023686	0.309385	0.001939	0	0.189725	0.025949	0.023686	0.309385	0.019635	0.202568	0	1.339893	0.001293	0	0.000747
Santa Clara	2024	LHDT1	Aggregate	Aggregate	Gasoline	19314.14	722529.3	722529.3	0	287751.9	0.17374	0.036221	0.636996	0.001534	0	0.000302	0.002	0.0273	0.001668	0	0.000328	0.008	0.078	871.4559	119.0993	25.78022	0.008358	0.112945	0.032997	0.009778	0.002977	0.050968	0.041718	0.415023	0.163611	0.047402	0.263136	2.768514	0.060875	0.605601	0.179134	0.047402	0.263136	2.768514	0.044898	1.142278	3.756209	3.123927	0.008615	0.001177	0.000255
Santa Clara	2024	LHDT1	Aggregate	Aggregate	Diesel	10107.74	398004.1	398004.1	0	127142.6	1.563015	1.92168	0	0.035058	0.026804	0	0.003	0.0273	0.036643	0.028016	0	0.012	0.078	631.4008	131.1503	0	0.008006	0.005098	0	0.099477	0.020663	0	0.172364	0.10976	0	0	0	0	0.196225	0.124954	0	0	0	0	0	0.172781	0.473594	0.909745	0	0.005983	0.001243	0
Santa Clara	2024	LHDT1	Aggregate	Aggregate	Electricity	70.82836	5110.544	0	5110.544	989.4273	0	0	0	0	0	0	0.002	0.01365	0	0	0	0.008	0.039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	LHDT2	Aggregate	Aggregate	Gasoline	2506.906	91452.57	91452.57	0	37349.16	0.16518	0.035604	0.621534	0.00139	0	0.000239	0.002	0.03185	0.001512	0	0.000259	0.008	0.091	980.0361	137.5922	25.51292	0.006183	0.111453	0.031983	0.009819	0.00291	0.049384	0.028613	0.40822	0.157242	0.04419	0.238167	2.558385	0.041752	0.595674	0.17216	0.04419	0.238167	2.558385	0.044971	0.899209	3.762546	3.129931	0.009689	0.00136	0.000252
Santa Clara	2024	LHDT2	Aggregate	Aggregate	Diesel	4663.455	183558.4	183558.4	0	58660.4	1.266102	1.895403	0	0.032055	0.027	0	0.003	0.03185	0.033504	0.028221	0	0.012	0.091	756.8682	209.5618	0	0.007406	0.005098	0	0.119245	0.033017	0	0.159439	0.10976	0	0	0	0	0.18151	0.124954	0	0	0	0	0	0.184132	0.411861	0.909745	0	0.007172	0.001986	0
Santa Clara	2024	LHDT2	Aggregate	Aggregate	Electricity	18.33259	1253.286	0	1253.286	242.668	0	0	0	0	0	0	0.002	0.015925	0	0	0	0.008	0.0455	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	MCY	Aggregate	Aggregate	Gasoline	28171.51	1660222.3	1660222.3	0	56343.02	0.571344	0	0.135477	0.001779	0	0.003248	0.001	0.0042	0.001902	0	0.003456	0.004	0.012	187.743	0	48.37697	0.162609	0	0.181972	0.039558	0	0.00802	1.062175	0	1.345317	3.559276	3.75283	3.900294	1.276951	0	1.462608	3.559276	3.75283	3.900294	0.008808	12.6697	0	8.002987	0.001856	0	0.000478
Santa Clara	2024	MDV	Aggregate	Aggregate	Gasoline	156642.4	5468054	5468054	0	726101.1	0.101279	0	0.42828	0.001229	0	0.002042	0.002	0.003184	0.001336	0	0.002221	0.008	0.009096	412.8049	0	106.2216	0.003873	0	0.10186	0.007628	0	0.040967	0.01626	0	0.508806	0.097051	0.275722	1.677059	0.023715	0	0.557077	0.097051	0.275722	1.677059	0.036179	0.972241	0	4.022964	0.004081	0	0.00105
Santa Clara	2024	MDV	Aggregate	Aggregate	Diesel	2400.615	86292.69	86292.69	0	11318.82	0.048844	0	0	0.004909	0	0	0.002	0.003206	0.005131	0	0	0.008	0.009159	405.6621	0	0	0.00051	0	0	0.063912	0	0	0.010978	0	0	0	0	0	0.012498	0	0	0	0	0	0.0031	0.201538	0	0	0.003844	0	0
Santa Clara	2024	MDV	Aggregate	Aggregate	Electricity	1678.684	58660.63	0	58660.63	8578.496	0	0	0	0	0	0	0.002	0.001525	0	0	0	0.008	0.004358	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	MDV	Aggregate	Aggregate	Plug-in Hyb	1250.857	52904.03	25301.52	27602.51	5172.294	0.003138	0	0.11551	0.000561	0	0.001962	0.002	0.001382	0.00061	0	0.002134	0.008	0.003948	133.5372	0	94.06379	0.000423	0	0.042047	0.000554	0	0.020395	0.001357	0	0.173285	0.030318	0.026684	0.341695	0.00198	0	0.189725	0.030318	0.026684	0.341695	0.020087	0.206737	0	1.339893	0.00132	0	0.00093
Santa Clara	2024	MH	Aggregate	Aggregate	Gasoline	2420.57	22012.3	22012.3	0	242.1538	0.420938	0	0.419963	0.001679	0	0.000404	0.003	0.015756	0.001826	0	0.000439	0.012	0.045017	1947.501	0	31.65056	0.015478	0	0.037539	0.025731	0	0.04407	0.06827	0	0.159123	12.21143	0.286769	4.596479	0.09962	0	0.174219	12.21143	0.286769	4.596479	0.044846	1.682224	0	3.497247	0.019253	0	0.000313
Santa Clara	2024	MH	Aggregate	Aggregate	Diesel	977.3606	9498.302	9498.302	0	977.3606	4.117169	0	0	0.091772	0	0	0.004	0.015675	0.095921	0	0	0.016	0.044785	1081.931	0	0	0.005558	0	0	0.170459	0	0	0.11965	0	0	0	0	0	0.136214	0	0	0	0	0	0.155539	0.397281	0	0	0.010252	0	0
Santa Clara	2024	MHDT	Aggregate	Aggregate	Gasoline	1414.552	71600.35	71600.35	0	28302.35	0.470752	0.088485	0.440963	0.001362	0	0.000533	0.003	0.015756	0.001482	0	0.000579	0.012	0.045017	1768.687	531.8002	46.25227	0.015051	0.25808	0.047572	0.022913	0.00727	0.03271	0.074951	1.01271	0.265405	0.033945	0.276365	2.798712	0.109368	1.477744	0.290585	0.033945	0.276365	2.798712	0.04498	1.56073	15.11634	5.825814	0.017485	0.005257	0.000457
Santa Clara	2024	MHDT	Aggregate	Aggregate	Diesel	10390.53	434043.6	434043.6	0	123939	1.232824	13.11952	1.642732	0.014397	0.029902	0	0.003	0.015941	0.015048	0.031254	0	0.012	0.045546	1147.309	2248.547	0	0.001507	0.01158	0	0.180759	0.35426	0	0.032455	0.249319	0	0	0	0	0.036947	0.283831	0	0	0	0	0	0.210532	0.120871	7.556027	0	0.010864	0.021292	0
Santa Clara	2024	MHDT	Aggregate	Aggregate	Electricity	30.91601	1660.353	0	1660.353	407.4536	0	0	0	0	0	0	0.003	0.007956	0	0	0	0.012	0.022732	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	MHDT	Aggregate	Aggregate	Natural Ga	90.59449	4303.581	4303.581	0	827.6228	0.133415	6.499719	0	0.001179	0.018131	0	0.003	0.016007	0.001282	0.019719	0	0.012	0.045734	984.6917	5301.101	0	0.74573	17.31409	0	0.200736	1.080664	0	0.010655	0.247384	0	0	0	0	0.761072	17.6703	0	0	0	0	0	1.06	2.995842	34.7393	0	0	0	0
Santa Clara	2024	OBUS	Aggregate	Aggregate	Gasoline	443.1467	19894.31	19894.31	0	8866.48	0.49672	0.06506	0.408547	0.000907	0	0.000252	0.003	0.01568	0.000987	0	0.000274	0.012	0.044799	1764.001	379.4143	31.61308	0.013757	0.195733	0.03606	0.024018	0.005304	0.031028	0.067076	0.746281	0.190964	0.033873	0.154922	2.818385	0.097877	1.088971	0.209081	0.033873	0.154922	2.818385	0.044969	1.491576	5.774637	4.000641	0.017439	0.003751	0.000313
Santa Clara	2024	OBUS	Aggregate	Aggregate	Diesel	893.1376	61949.05	61949.05	0	9141.625	1.178643	7.363387	1.543157	0.019849	0.008167	0	0.003	0.018015	0.020746	0.008536	0	0.012	0.051472	1273.38	1538.564	0	0.001935	0.020479	0	0.200622	0.242401	0	0.04166	0.440905	0	0	0	0	0.047427	0.501937	0	0	0	0	0	0.216021	0.150181	7.500483	0	0.012058	0.014569	0
Santa Clara	2024	OBUS	Aggregate	Aggregate	Electricity	1.087481	92.50105	0	92.50105	21.75833	0	0	0	0	0	0	0.003	0.00784	0	0	0	0.012	0.022399	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	OBUS	Aggregate	Aggregate	Natural Ga	7.05737	469.3876	469.3876	0	62.81059	0.190585	1.537414	0	0.00106	0.003899	0	0.003	0.016148	0.001153	0.004241	0	0.012	0.046137	1004.237	1191.581	0	0.789796	4.236895	0	0.20472	0.242912	0	0.011285	0.060537	0	0	0	0	0.806045	4.324062	0	0	0	0	0	1.06	3.254325	7.353064	0	0	0	0
Santa Clara	2024	SBUS	Aggregate	Aggregate	Gasoline	172.6948	8584.866	8584.866	0	690.7791	0.50288	0.925939	0.716801	0.000864	0	0.000567	0.002	0.015721	0.000939	0	0.000616	0.008	0.044917	810.6064	2589.131	58.1367	0.011135	2.464862	0.074893	0.027101	0.086311	0.065929	0.054059	10.63288	0.426367	0.113914	0.274691	1.686167	0.078883	15.51547	0.466819	0.113914	0.274691	1.686167	0.045	1.38705	82.18841	10.36621	0.008014	0.025596	0.000575
Santa Clara	2024	SBUS	Aggregate	Aggregate	Diesel	670.5958	15345.26	15345.26	0	9710.228	3.821388	21.87689	0.482851	0.019766	0.019703	0	0.003	0.015721	0.02066	0.020594	0	0.012	0.044917	1144.18	2229	0	0.002665	0.008001	0	0.180266	0.35118	0	0.057376	0.172257	0	0	0	0	0.065318	0.196101	0	0	0	0	0	0.148025	0.1775	4.677792	0	0.010835	0.021107	0
Santa Clara	2024	SBUS	Aggregate	Aggregate	Electricity	2.064666	64.35501	0	64.35501	23.64639	0	0	0	0	0	0	0.002539	0.00786	0	0	0	0.010157	0.022459	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	SBUS	Aggregate	Aggregate	Natural Ga	24.3995	612.0941	612.0941	0	353.3048	0.567729	5.270895	0	0.003378	0.011357	0	0.003	0.015721	0.003674	0.012352	0	0.012	0.044917	1261.305	4066.736	0	3.436672	15.25665	0	0.257125	0.829031	0	0.049103	0.217987	0	0	0	0	3.507376	15.57053	0	0	0	0	0	1.06	11.64901	20.74693	0	0	0	0
Santa Clara	2024	UBUS	Aggregate	Aggregate	Gasoline	46.08313	4812.451	4812.451	0	184.3325	0.027483	0	0.457232	0.001143	0	0.000128	0.002	0.03185	0.001243	0	0.00014	0.008	0.091	926.0836	0	36.94783	0.002034	0	0.043067	0.004288	0	0.071717	0.005634	0	0.152979	0.038099	0.092116	0.456438	0.008221	0	0.167492	0.038099	0.092116	0.456438	0.045	0.581148	0	6.130495	0.009155	0	0.000365
Santa Clara	2024	UBUS	Aggregate	Aggregate	Diesel	437.4745	48917.61	48917.61	0	1749.898	0.386257	0	0	0.007023	0	0	0.0083	0.0385	0.00734	0	0	0.0332	0.11	1101.14	0	0	0.003215	0	0	0.173485	0	0	0.069208	0	0	0	0	0	0.078788	0	0	0	0	0	0.187908	0.079368	0	0	0.010434	0	0
Santa Clara	2024	UBUS	Aggregate	Aggregate	Electricity	5.347565	235.0626	0	235.0626	21.39026	0	0	0	0	0	0	0.008888	0.01925	0	0	0	0.03552	0.055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2024	UBUS	Aggregate	Aggregate	Natural Ga	42.58696	4865.187	4865.187	0	170.3478	0.058788	0	0	0.000282	0	0	0.008183	0.0385	0.000295	0	0	0.032731	0.11	1299.206	0	0	4.246059	0	0	0.264852	0	0	0.060668	0	0	0	0	0	4.333415	0	0	0	0	0	0.97	49.04786	0	0	0	0	0

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_DIU	PM2.5_TIR	PM2.5_BW	PM10_RUN	PM10_IDL	PM10_STR	PM10_DIU	PM10_TIR	PM10_BW	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTS	ROG_RUNL	ROG_DIUR	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTS	TOG_RUNL	TOG_DIUR	NH3_RUNEX	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNEX	SOx_IDLEX	SOx_STREX
Santa Clara	2025	HHDT	Aggregate	Aggregate	Gasoline	2.330359	124.9448	124.9448	0	0	46.62582	5.556909	0	1.379041	0.003103	0	0.001399	0.005	0.033068	0.003375	0	0.001521	0.02	0.09448	2106.229	0	50.03138	0.207413	0	0.000226	0.167059	0	0.041557	1.222197	0	0.00123	0.140217	1.263022	9.434649	1.783427	0	0.001346	0.140217	1.263022	9.434649	0.043157	47.7242	0	2.001616	0.020822	0	0.000495
Santa Clara	2025	HHDT	Aggregate	Aggregate	Diesel	8692.575	1008964	1008964	0	127877.1	1.825194	60.91449	2.931995	0.025335	0.028938	0	0.008772	0.027421	0.02648	0.030247	0	0.035088	0.078345	1608.776	11755.34	0	0.00075	0.235891	0	0.253463	1.852058	0	0.016139	5.078674	0	0	0	0	0	0.018373	5.781684	0	0	0	0	0	0.215507	0.078083	74.00904	0	0.015234	0.111316	0
Santa Clara	2025	HHDT	Aggregate	Aggregate	Electricity	63.3712	6579.675	0	6579.675	825.9972	0	0	0	0	0	0	0.008551	0.014281	0	0	0	0	0.034206	0.040802	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	HHDT	Aggregate	Aggregate	Natural Ga	832.405	55779.38	55779.38	0	7555.504	1.049864	13.18492	0	0.00168	0.025258	0	0.009	0.048303	0.001827	0.02747	0	0.036	0.138007	1375.94	10529.31	0	2.235928	35.17609	0	0.280494	2.146469	0	0.047235	0.530122	0	0	0	0	0	0.299347	35.93114	0	0	0	0	0	0.843784	13.01274	74.75478	0	0	0	0
Santa Clara	2025	LDA	Aggregate	Aggregate	Gasoline	598860.3	22133915	22133915	0	2780384	0.038209	0	0.245539	0.001142	0	0.00188	0.002	0.002655	0.001242	0	0.002044	0.008	0.007587	270.1738	0	68.47346	0.002117	0	0.067825	0.004408	0	0.032293	0.007947	0	0.306311	0.087189	0.224301	1.384954	0.011596	0	0.335372	0.087189	0.224301	1.384954	0.035611	0.6952	0	3.049452	0.002671	0	0.000677
Santa Clara	2025	LDA	Aggregate	Aggregate	Diesel	1620.04	46912.85	46912.85	0	6871.193	0.18842	0	0	0.015236	0	0	0.002	0.002712	0.015925	0	0	0.008	0.007748	229.9477	0	0	0.001193	0	0	0.036228	0	0	0.025693	0	0	0	0	0	0	0.02925	0	0	0	0	0	0.0031	0.319914	0	0	0.002179	0	0
Santa Clara	2025	LDA	Aggregate	Aggregate	Electricity	61443.19	2670452	0	2670452	299852.7	0	0	0	0	0	0	0.002	0.001534	0	0	0	0.008	0.004382	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	LDA	Aggregate	Aggregate	Plug-in Hyb	19037.66	825567.7	401013	424554.8	78720.74	0.003187	0	0.11551	0.000578	0	0.001985	0.002	0.001382	0.000629	0	0.002159	0.008	0.003948	135.5854	0	64.10836	0.000432	0	0.042249	0.000569	0	0.020584	0.001378	0	0.173285	0.041164	0.03735	0.440525	0.002011	0	0.189725	0.041164	0.03735	0.440525	0.019241	0.209757	0	1.339893	0.00134	0	0.000634
Santa Clara	2025	LDT1	Aggregate	Aggregate	Gasoline	51680.86	1664706	1664706	0	230186	0.115355	0	0.35972	0.001639	0	0.002543	0.002	0.003241	0.001782	0	0.002766	0.008	0.00926	321.489	0	84.45547	0.005621	0	0.098552	0.008687	0	0.037511	0.02471	0	0.498818	0.156963	0.442299	2.52236	0.038056	0	0.546143	0.156963	0.442299	2.52236	0.036453	1.317416	0	4.886115	0.003178	0	0.000835
Santa Clara	2025	LDT1	Aggregate	Aggregate	Diesel	21.28272	302.8258	302.8258	0	59.13231	1.64381	0	0	0.238169	0	0	0.002	0.00372	0.248938	0	0	0.008	0.010628	414.9442	0	0	0.013797	0	0	0.065375	0	0	0.297038	0	0	0	0	0	0	0.338158	0	0	0	0	0	0.0031	1.585068	0	0	0.003932	0	0
Santa Clara	2025	LDT1	Aggregate	Aggregate	Electricity	234.4578	9323.704	0	9323.704	1109.796	0	0	0	0	0	0	0.002	0.001537	0	0	0	0.008	0.004392	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	LDT1	Aggregate	Aggregate	Plug-in Hyb	98.13198	4519.182	1961.286	2557.896	405.7758	0.002848	0	0.11551	0.000353	0	0.001365	0.002	0.001394	0.000383	0	0.001485	0.008	0.003982	121.222	0	67.75681	0.000383	0	0.041987	0.000501	0	0.020339	0.001231	0	0.173285	0.023895	0.020384	0.276746	0.001797	0	0.189725	0.023895	0.020384	0.276746	0.018228	0.187824	0	1.339893	0.001198	0	0.00067
Santa Clara	2025	LDT2	Aggregate	Aggregate	Gasoline	290874.7	10447706	10447706	0	1360241	0.06257	0	0.314364	0.001192	0	0.001919	0.002	0.00313	0.001296	0	0.002087	0.008	0.008944	332.1841	0	85.06833	0.002642	0	0.078494	0.005588	0	0.036037	0.010244	0	0.360071	0.079452	0.214938	1.349256	0.014949	0	0.394233	0.079452	0.214938	1.349256	0.03712	0.795621	0	3.47417	0.003284	0	0.000841
Santa Clara	2025	LDT2	Aggregate	Aggregate	Diesel	1049.952	38652.34	38652.34	0	4980.34	0.039332	0	0	0.004727	0	0	0.002	0.003123	0.004941	0	0	0.008	0.008921	301.0055	0	0	0.000603	0	0	0.047424	0	0	0.01298	0	0	0	0	0	0	0.014777	0	0	0	0	0	0.0031	0.129797	0	0	0.002852	0	0
Santa Clara	2025	LDT2	Aggregate	Aggregate	Electricity	2157.059	73663.77	0	73663.77	10962.38	0	0	0	0	0	0	0.002	0.001527	0	0	0	0.008	0.004362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	LDT2	Aggregate	Aggregate	Plug-in Hyb	2561.885	112327.2	51267.44	61059.78	10593.4	0.002995	0	0.11551	0.000438	0	0.00161	0.002	0.001388	0.000477	0	0.001751	0.008	0.003967	127.4509	0	74.14084	0.000403	0	0.041992	0.000528	0	0.020344	0.001295	0	0.173285	0.026071	0.023359	0.305362	0.001893	0	0.189725	0.026071	0.023359	0.305362	0.019143	0.197358	0	1.339893	0.00126	0	0.000733
Santa Clara	2025	LHDT1	Aggregate	Aggregate	Gasoline	19422.46	728337	728337	0	289365.8	0.152112	0.035118	0.61458	0.001478	0	0.000276	0.002	0.0273	0.001607	0	0.0003	0.008	0.078	855.4024	117.9783	25.70715	0.007214	0.110329	0.031611	0.008613	0.002941	0.049929	0.03557	0.40247	0.15588	0.044275	0.247775	2.616411	0.051904	0.587284	0.170669	0.044275	0.247775	2.616411	0.044934	1.05316	3.759094	3.16195	0.008457	0.001166	0.000254
Santa Clara	2025	LHDT1	Aggregate	Aggregate	Diesel	10387.1	408019.3	408019.3	0	130656.7	1.379237	1.823414	0	0.032347	0.026692	0	0.003	0.0273	0.03381	0.027899	0	0.012	0.078	628.07	129.5472	0	0.007468	0.005098	0	0.098953	0.02041	0	0.160779	0.10976	0	0	0	0	0	0.183036	0.124954	0	0	0	0	0	0.17898	0.435087	0.909745	0	0.005951	0.001228	0
Santa Clara	2025	LHDT1	Aggregate	Aggregate	Electricity	196.402	13079.06	0	13079.06	2746.629	0	0	0	0	0	0	0.002	0.01365	0	0	0	0.008	0.039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	LHDT2	Aggregate	Aggregate	Gasoline	2512.652	91345.05	91345.05	0	37434.78	0.146187	0.034452	0.600885	0.001346	0	0.00022	0.002	0.03185	0.001464	0	0.000239	0.008	0.091	964.5764	136.4471	25.31105	0.005467	0.108422	0.030581	0.008804	0.002854	0.048245	0.025115	0.395081	0.149459	0.041982	0.228581	2.471298	0.036648	0.576501	0.163639	0.041982	0.228581	2.471298	0.044974	0.850878	3.765161	3.139903	0.009536	0.001349	0.00025
Santa Clara	2025	LHDT2	Aggregate	Aggregate	Diesel	4837.236	188645	188645	0	60846.34	1.139289	1.802658	0	0.030296	0.027005	0	0.003	0.03185	0.031666	0.028226	0	0.012	0.091	750.3571	207.2396	0	0.007043	0.005098	0	0.118219	0.032651	0	0.151622	0.10976	0	0	0	0	0	0.172612	0.124954	0	0	0	0	0	0.188496	0.387904	0.909745	0	0.00711	0.001964	0
Santa Clara	2025	LHDT2	Aggregate	Aggregate	Electricity	50.46202	3193.251	0	3193.251	669.175	0	0	0	0	0	0	0.002	0.015925	0	0	0	0.008	0.0455	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	MCY	Aggregate	Aggregate	Gasoline	28484.89	166414.5	166414.5	0	56969.79	0.557882	0	0.129146	0.001799	0	0.003253	0.001	0.0042	0.001925	0	0.003464	0.004	0.012	187.2679	0	47.30784	0.158292	0	0.177199	0.038984	0	0.007691	1.024683	0	1.305157	3.558651	3.760078	3.860886	1.236542	0	1.419098	3.558651	3.760078	3.860886	0.008851	12.31202	0	7.965438	0.001851	0	0.000468
Santa Clara	2025	MDV	Aggregate	Aggregate	Gasoline	159532.2	5551044	5551044	0	739781.4	0.087905	0	0.391886	0.001179	0	0.001962	0.002	0.003182	0.001282	0	0.002134	0.008	0.009091	402.7635	0	103.4378	0.003431	0	0.094137	0.006921	0	0.039073	0.014165	0	0.463643	0.092515	0.265086	1.620407	0.020668	0	0.50763	0.092515	0.265086	1.620407	0.036883	0.895922	0	3.753621	0.003982	0	0.001023
Santa Clara	2025	MDV	Aggregate	Aggregate	Diesel	2421.364	85326.8	85326.8	0	11351.14	0.044948	0	0	0.004686	0	0	0.002	0.003225	0.004898	0	0	0.008	0.009216	399.4952	0	0	0.000492	0	0	0.062941	0	0	0.010592	0	0	0	0	0	0	0.012058	0	0	0	0	0	0.0031	0.199936	0	0	0.003785	0	0
Santa Clara	2025	MDV	Aggregate	Aggregate	Electricity	2274.547	77934.96	0	77934.96	11571.06	0	0	0	0	0	0	0.002	0.001526	0	0	0	0.008	0.004361	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	MDV	Aggregate	Aggregate	Plug-in Hyb	1542.366	64484.39	29833.21	34651.18	6377.683	0.003036	0	0.11551	0.000507	0	0.00183	0.002	0.001388	0.000551	0	0.00199	0.008	0.003965	129.1743	0	91.64114	0.000407	0	0.041816	0.00053	0	0.02018	0.001313	0	0.173285	0.02949	0.025333	0.327899	0.001916	0	0.189725	0.02949	0.025333	0.327899	0.019431	0.199968	0	1.339893	0.001277	0	0.000906
Santa Clara	2025	MH	Aggregate	Aggregate	Gasoline	2337.876	21506.19	21506.19	0	233.8812	0.37652	0	0.425905	0.001612	0	0.000388	0.003	0.015756	0.001753	0	0.000422	0.012	0.045017	1947.057	0	31.4529	0.013722	0	0.036945	0.023864	0	0.045303	0.059455	0	0.154277	11.38549	0.268831	4.357209	0.086757	0	0.168914	11.38549	0.268831	4.357209	0.044879	1.426924	0	3.382931	0.019249	0	0.000311
Santa Clara	2025	MH	Aggregate	Aggregate	Diesel	994.5437	9603.893	9603.893	0	99.45437	3.976372	0	0	0.086098	0	0	0.004	0.015675	0.08999	0	0	0.016	0.044785	1082.401	0	0	0.005421	0	0	0.170533	0	0	0.116701	0	0	0	0	0	0	0.132856	0	0	0	0	0	0.160635	0.385118	0	0	0.010256	0	0
Santa Clara	2025	MHDT	Aggregate	Aggregate	Gasoline	1412.263	72039.87	72039.87	0	28256.55	0.394798	0.086175	0.424333	0.001347	0	0.000513	0.003	0.015756	0.001465	0	0.000558	0.012	0.045017	1746.959	526.7233	45.37618	0.012585	0.261076	0.04598	0.019987	0.007219	0.032398	0.061949	1.015127	0.253154	0.030988	0.250472	2.558011	0.090397	1.481271	0.277172	0.030988	0.250472	2.558011	0.044991	1.276089	15.1444	5.531626	0.01727	0.005207	0.000449
Santa Clara	2025	MHDT	Aggregate	Aggregate	Diesel	10548.06	435100.6	435100.6	0	125915.2	1.128155	12.48973	1.646559	0.012461	0.024792	0	0.003	0.015941	0.013024	0.025912	0	0.012	0.045545	1141.328	2229.374	0	0.00131	0.010957	0	0.179817	0.351239	0	0.028195	0.235896	0	0	0	0	0	0.032098	0.268549	0	0	0	0	0	0.211891	0.109646	7.535393	0	0.010808	0.021111	0
Santa Clara	2025	MHDT	Aggregate	Aggregate	Electricity	90.80851	4838.906	0	4838.906	1182.343	0	0	0	0	0	0	0.003	0.007951	0	0	0	0.012	0.022718	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	MHDT	Aggregate	Aggregate	Natural Ga	98.90628	4590.307	4590.307	0	911.9208	0.12435	6.45266	0	0.002126	0.018594	0	0.003	0.016009	0.001333	0.020223	0	0.012	0.045741	979.0142	5290.545	0	0.751438	16.97256	0	0.199578	1.078512	0	0.010737	0.242504	0	0	0	0	0	0.766898	17.32175	0	0	0	0	0	1.06	2.996166	35.80775	0	0	0	0
Santa Clara	2025	OBUS	Aggregate	Aggregate	Gasoline	430.7023	18962.49	18962.49	0	8617.491	0.460353	0.06398	0.405045	0.000939	0	0.000255	0.003	0.01568	0.001022	0	0.000278	0.012	0.044799	1744.286	377.0226	31.37018	0.012641	0.195762	0.035581	0.02242	0.005219	0.030806	0.061504	0.74652	0.188569	0.033827	0.158433	2.881145	0.089747	1.089321	0.206459	0.033827	0.158433	2.881145	0.04498	1.352776	5.776073	3.953891	0.017244	0.003727	0.00031
Santa Clara	2025	OBUS	Aggregate	Aggregate	Diesel	921.4116	62304.89	62304.89	0	9451.527	1.133246	7.151668	1.532624	0.018916	0.007596	0	0.003	0.018017	0.019772	0.007939	0	0.012	0.051478	1259.126	1532.11	0	0.001844	0.020685	0	0.198376	0.241385	0	0.039711	0.445333	0	0	0	0	0	0.045208	0.506978	0	0	0	0	0	0.216212	0.14449	7.587325	0	0.011923	0.014508	0
Santa Clara	2025	OBUS	Aggregate	Aggregate	Electricity	2.672031	221.771	0	221.771	53.46199	0	0	0	0	0	0	0.003	0.00784	0	0	0	0.012	0.022399	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	OBUS	Aggregate	Aggregate	Natural Ga	8.125306	537.7468	537.7468	0	72.31523	0.164816	1.526623	0	0.001183	0.004157	0	0.003	0.016148	0.001287	0.004521	0	0.012	0.046137	987.912	1189.826	0	0.803903	4.103659	0	0.201392	0.242554	0	0.011486	0.058633	0	0	0	0	0	0.820442	4.188085	0	0	0	0	0	1.06	3.29233	7.933419	0	0	0	0
Santa Clara	2025	SBUS	Aggregate	Aggregate	Gasoline	178.2436	8812.851	8812.851	0	712.9742	0.487257	0.905562	0.722985	0.000866	0	0.000573	0.002	0.015721	0.000942	0	0.000623	0.008	0.044917	806.3455	2576.863	57.67146	0.010523	2.465929	0.074733	0.026439	0.084425	0.066434	0.051046	10.63602	0.42511	0.118631	0.292211	1.797789	0.074486	15.52005	0.465442	0.118631	0.292211	1.797789	0.045	1.308927	82.20747	10.20511	0.007972	0.025475	0.00057
Santa Clara	2025	SBUS	Aggregate	Aggregate	Diesel	673.2048	15283.75	15283.75	0	9748.005	3.614242	21.25646	0.496308	0.018677	0.018235	0	0.003	0.015721	0.019521	0.019059	0	0.012	0.044917	1139.829	2219.616	0	0.002583	0.007936	0	0.179581	0.349701	0	0.055601	0.170862	0	0	0	0	0	0.063298	0.194514	0	0	0	0	0	0.151888	0.17348	4.777291	0	0.010794	0.021018	0
Santa Clara	2025	SBUS	Aggregate	Aggregate	Electricity	4.481168	145.0761	0	145.0761	51.24766	0	0	0	0	0	0	0.002	0.002556	0.00786	0	0	0	0.010226	0.022459	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	SBUS	Aggregate	Aggregate	Natural Ga	25.28439	627.586	627.586	0	366.118	0.5494	5.260001	0	0.003378	0.011617	0	0.003	0.015721	0.003674	0.012635	0	0.012	0.044917	1252.115	4074.049	0	3.386209	15.12215	0	0.255252	0.830522	0	0.048382	0.216066	0	0	0	0	0	3.455875	15.43326	0	0	0	0	0	1.06	11.41153	21.33281	0	0	0	0
Santa Clara	2025	UBUS	Aggregate	Aggregate	Gasoline	46.21918	4826.658	4826.658	0	184.8767	0.027276	0	0.449893	0.001143	0	0.000128	0.002	0.03185	0.001243	0	0.00014	0.008	0.091	925.8676	0	36.64281	0.001993	0	0.043054	0.004259	0	0.070843	0.005515	0	0.152699	0.04366	0.092112	0.471505	0.008047	0	0.167186	0.04366	0.092112	0.471505	0.045	0.586139	0	5.942314	0.009153	0	0.000362
Santa Clara	2025	UBUS	Aggregate	Aggregate	Diesel	405.3675	44987.37	44987.37	0	1621.47	0.382968	0	0	0.006962	0	0	0.008	0.03238	0.0385	0.007277	0	0	0.032951	0.11	1121.875	0	0	0.003193	0	0	0.176752	0	0	0.06875	0	0	0	0	0	0.078266	0	0	0	0	0	0.22	0.0787	0	0	0.01063	0	0
Santa Clara	2025	UBUS	Aggregate	Aggregate	Electricity	23.31202	2427.54	0	2427.54	93.24809	0	0	0	0	0	0	0.008977	0.01925	0	0	0	0	0.035907	0.055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2025	UBUS	Aggregate	Aggregate	Natural Ga	58.16247	6762.418	6762.418	0	232.6499	0.060506	0	0	0.000287	0	0	0.008408	0.0385	0.0003	0	0	0	0.033634	0.11	1317.877	0	0	4.320397	0	0	0.268658	0	0	0.06173	0	0	0	0	0	4.409282	0	0	0	0	0	0.97	50.3461	0	0	0	0	0

Attachment 4: Project Construction Emissions and Health Risk Calculations

2655 The Alameda, Santa Clara, CA

Year	Unmitigated DPM	DPM EMFAC2021	Unmitigated Emissions	Unmitigated Fug PM2.5	Fug PM2.5 EMFAC2021	Unmitigated Emissions
2023	0.0035	0.0001	0.0036	0.0001	0.0001	0.0001
2024-2025	0.0206	0.0002	0.0208	0.0000	0.0002	0.0002

Year	Mitigated DPM	DPM EMFAC2021	Mitigated Emissions	Mitigated Fug PM2.5	Fug PM2.5 EMFAC2021	Mitigated Emissions
2023	0.0003	0.0001	0.0003	0.00003	0.0001	0.0001
2024-2025	0.0014	0.0002	0.0016	0.0000	0.0002	0.0002

2655 The Alameda, Santa Clara, CA

DPM Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2023	Construction	0.0036	CON_DPM	7.1	0.00163	2.05E-04	1623	1.27E-07
2024-2025*	Construction	0.0208	CON_DPM	41.7	0.00951	1.20E-03	1623	7.38E-07
Total		***0.0244***		***48.8***	***0.0111***	***0.0014***		

* Includes 2025 (two months of construction)

Construction Hours

hr/day =	12	(6am - 6pm)
days/yr =	365	
hours/year =	4380	

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2023	Construction	0.0003	CON_DPM	0.6	0.00015	1.83E-05	1623	1.13E-08
2024-2025*	Construction	0.0016	CON_DPM	3.2	0.00074	9.30E-05	1623	5.73E-08
Total		***0.0019***		***3.9***	***0.0009***	***0.0001***		

* Includes 2025 (two months of construction)

Construction Hours

hr/day =	12	(6am - 6pm)
days/yr =	365	
hours/year =	4380	

2655 The Alameda, Santa Clara, CA

PM2.5 Fugitive Dust Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2023	Construction	CON_FUG	0.0001	0.2	0.00006	7.13E-06	1,623	4.39E-09
2024-2025*	Construction	CON_FUG	0.0002	0.4	0.00010	1.28E-05	1,623	7.88E-09
Total			***0.0003***	***0.7***	***0.0002***	***0.0000***		

* Includes 2025 (two months of construction)

Construction Hours

hr/day =	12	(6am - 6pm)
days/yr =	365	
hours/year =	4380	

PM2.5 Fugitive Dust Construction Emissions for Modeling - With Mitigation

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2023	Construction	CON_FUG	0.0001	0.2	0.00004	5.40E-06	1,623	3.33E-09
2024-2025*	Construction	CON_FUG	0.0002	0.4	0.00010	1.28E-05	1,623	7.88E-09
Total			***0.0003***	***0.6***	***0.0001***	***0.0000***		

* Includes 2025 (two months of construction)

Construction Hours

hr/day =	12	(6am - 6pm)
days/yr =	365	
hours/year =	4380	

2655 The Alameda, Santa Clara, CA - Construction Health Impact Summary

Maximum Impacts at MEI Residential Location - Without Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Infant/Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2023	0.0048	0.0002	0.86	0.01	0.001	0.01
2024-2025*	0.0279	0.0004	4.59	0.08	0.01	0.03
Total	-	-	**5.44**	**0.09**	-	-
Maximum	0.0279	0.0004	**-**	**-**	**0.01**	**0.03**

* Includes 2025 (two months of construction)

Maximum Impacts at MEI Residential Location - With Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Infant/Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2023	0.0004	0.0002	0.08	0.001	0.0001	0.001
2024-2025*	0.0022	0.0004	0.36	0.01	0.0004	0.003
Total	-	-	**0.43**	**0.01**	-	-
Maximum	0.0022	0.0004	**-**	**-**	**0.0004**	**0.003**

* Includes 2025 (two months of construction)

- Tier 4 Interim Engines and BMPs Mitigation

Maximum Impacts at Kids On Campus - Without Mitigation

Construction Year	Unmitigated Emissions: Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Unmitigated Emissions: Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2023	0.0094	0.0005	3.39	0.002	0.01
2024-2025*	0.0545	0.0009	19.70	0.01	0.06
Total	-	-	**23.09**	-	-
Maximum	0.0545	0.0009	**-**	**0.01**	**0.06**

* Includes 2025 (two months of construction)

Maximum Impacts at Kids On Campus - With Mitigation

Construction Year	Unmitigated Emissions: Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Unmitigated Emissions: Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2023	0.0008	0.0004	0.30	0.0002	0.001
2024-2025*	0.0042	0.0009	1.53	0.001	0.01
Total	-	-	**1.83**	-	-
Maximum	0.0042	0.0009	**-**	**0.001**	**0.01**

* Includes 2025 (two months of construction)

- Tier 4 Interim Engines and BMPs Mitigation

2655 The Alameda, Santa Clara, CA- Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction Impacts at Kids On Campus (+6 weeks) - 1 meter - Child Exposure

Student Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x 1.0E6

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)

Inhalation Dose = C_{air} x SAF x 8-Hr BR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
SCAF = School Child Adjustment Factor (unitless) for source operation and exposures different than 8 hours/day
= (24/SHR) x (7days/SDay) x (SCHR/8 hrs)
SHR = Hours/day of emission source operation
SDay = Number of days per week of source operation
SCHR = School operation hours while emission source in operation
8-Hr BR = Eight-hour breathing rate (L/kg body weight-per 8 hrs)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant	School Child
Age -->	**0 - <2**	**2 - <16**
Parameter		
ASF =	10	3
DPM CPF =	1.10E+00	1.10E+00
8-Hr BR* =	1200	520
SCHR =	8	8
SHR =	12	12
SDay =	5	5
A =	1	1
EF =	250	250
AT =	70	70
SCAF =	2.80	2.80

* 95th percentile 8-hr breathing rates for moderate intensity activities

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)
1	1	0 - 1	2023	0.0094	10	3.39
2	1	1 - 2	2024-2025**	0.0545	10	19.70
Total Increased Cancer Risk						**23.09**

Maximum Hazard Index	Maximum Fugitive PM2.5	Maximum Total PM2.5
0.002	0.0005	0.01
0.011	0.001	0.06

* Children assumed to be 6 weeks and older with 2 years of Construction Exposure

** Includes 2025 (two months of construction)

2655 The Alameda, Santa Clara, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site Residential MEI Location - 1.5 meter receptor height (1st Floor Level)

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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} x DBR x A x (EF/365) x 10^{-6}

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
			DPM Conc (ug/m3)		Age	Infant/Child	Modeled DPM Conc (ug/m3)		Age	Adult			
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Hazard Index**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	2023	0.0048	10	0.07	2023	0.0048	-	-			
1	1	0 - 1	2023	0.0048	10	0.79	2023	0.0048	1	0.01	0.001	0.0002	0.01
2	1	1 - 2	2024-2025**	0.0279	10	4.59	2024-2025**	0.0279	1	0.08	0.01	0.0004	0.03
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**5.44**				**0.09**			

* Third trimester of pregnancy

** Includes 2025 (two months of construction)

2655 The Alameda, Santa Clara, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site Residential MEI Location - 4.5 meter receptor height (2nd Floor Level)

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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} x DBR x A x (EF/365) x 10^{-6}

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
			DPM Conc (ug/m3)		Age	Infant/Child	Modeled DPM Conc (ug/m3)		Age	Adult			
Exposure Year	Exposure Duration (years)	Age	Year	Annual	Sensitivity Factor	Cancer Risk (per million)	Year	Annual	Sensitivity Factor	Cancer Risk (per million)	Hazard Index	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2023	0.0042	10	0.06	2023	0.0042	-	-			
1	1	0 - 1	2023	0.0042	10	0.70	2023	0.0042	1	0.01	0.001	0.0002	0.004
2	1	1 - 2	2024-2025**	0.0247	10	4.05	2024-2025**	0.0247	1	0.07	0.005	0.0003	0.02
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**4.80**				**0.08**			

* Third trimester of pregnancy

** Includes 2025 (two months of construction)

2655 The Alameda, Santa Clara, CA- Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction Impacts at Kids On Campus (+6 weeks) - 1 meter - Child Exposure

Student Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x 1.0E6

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)

Inhalation Dose = C_{air} x SAF x 8-Hr BR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
SCAF = School Child Adjustment Factor (unitless) for source operation and exposures different than 8 hours/day
= (24/SHR) x (7days/SDay) x (SCHR/8 hrs)
SHR = Hours/day of emission source operation
SDay = Number of days per week of source operation
SCHR = School operation hours while emission source in operation
8-Hr BR = Eight-hour breathing rate (L/kg body weight-per 8 hrs)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant	School Child
Age -->	**0 - <2**	**2 - <16**
Parameter		
ASF =	10	3
DPM CPF =	1.10E+00	1.10E+00
8-Hr BR* =	1200	520
SCHR =	8	8
SHR =	12	12
SDay =	5	5
A =	1	1
EF =	250	250
AT =	70	70
SAF =	2.80	2.80

* 95th percentile 8-hr breathing rates for moderate intensity activities

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)
1	1	0 - 1	2023	0.0008	10	0.30
2	1	1 - 2	2024-2025**	0.0042	10	1.53
Total Increased Cancer Risk						**1.83**

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.0002	0.0004	0.001
0.001	0.001	0.01

* Children assumed to be 6 weeks and older with 2 years of Construction Exposure

** Includes 2025 (two months of construction)

2655 The Alameda, Santa Clara, CA - Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site Residential MEI Location - 1.5 meter receptor height (1st Floor Level)

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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} x DBR x A x (EF/365) x 10^{-6}

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult	Maximum		
			DPM Conc (ug/m3)		Age	Cancer	Modeled DPM Conc (ug/m3)		Age	Cancer			
Exposure Year	Exposure Duration (years)	Age	Year	Annual	Sensitivity Factor	Risk (per million)	Year	Annual	Sensitivity Factor	Risk (per million)	Hazard Index	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2023	0.0004	10	0.01	2023	0.0004	-	-			
1	1	0 - 1	2023	0.0004	10	0.07	2023	0.0004	1	0.00	0.0001	0.0002	0.001
2	1	1 - 2	2024-2025**	0.0022	10	0.36	2024-2025**	0.0022	1	0.01	0.0004	0.0004	0.003
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**0.43**				**0.01**			

* Third trimester of pregnancy

** Includes 2025 (two months of construction)

2655 The Alameda, Santa Clara, CA - Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site Residential MEI Location - 4.5 meter receptor height (2nd Floor Level)

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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} x DBR x A x (EF/365) x 10^{-6}

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult	Maximum		
			DPM Conc (ug/m3)		Age	Cancer	Modeled DPM Conc (ug/m3)		Age	Cancer			
Exposure Year	Exposure Duration (years)	Age	Year	Annual	Sensitivity Factor	Risk (per million)	Year	Annual	Sensitivity Factor	Risk (per million)	Hazard Index	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2023	0.0004	10	0.01	2023	0.0004	-	-			
1	1	0 - 1	2023	0.0004	10	0.06	2023	0.0004	1	0.00	0.0001	0.0001	0.001
2	1	1 - 2	2024-2025**	0.0019	10	0.31	2024-2025**	0.0019	1	0.01	0.0004	0.0003	0.002
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**0.38**				**0.01**			

* Third trimester of pregnancy

** Includes 2025 (two months of construction)

Attachment 5: Community Risk Modeling Information and Calculations

CT-EMFAC2017 Emissions Factors for Santa Clara County 2023

File Name:	2655 The Alameda - Santa Clara (SF) - 2023 - Annual.EF
CT-EMFAC2017 Version:	1.0.2.27401
Run Date:	9/8/2022 14:00
Area:	Santa Clara (SF)
Analysis Year:	2023
Season:	Annual

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.015	0.487	0.513
Truck 2	0.02	0.938	0.047
Non-Truck	0.965	0.014	0.958

Road Type:	Major/Collector	
Silt Loading Factor:	CARB	0.032 g/m2
Precipitation Correction:	CARB	P = 64 days N = 365 days

Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

Pollutant Name	<= 5 mph	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph
PM2.5	0.009229	0.005981	0.004054	0.002896	0.002194	0.001765	0.001511	0.001375	0.001329
TOG	0.195764	0.127928	0.086105	0.061055	0.046181	0.036838	0.030861	0.027137	0.025044
Diesel PM	0.000904	0.000732	0.000563	0.000446	0.000382	0.000353	0.00035	0.00037	0.000411

Fleet Average Running Loss Emission Factors (grams/veh-hour)

Pollutant Name	Emission Factor
TOG	1.35761

Fleet Average Tire Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.002108

Fleet Average Brake Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.016808

Fleet Average Road Dust Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.014855

==========END==========

El Camino Real Traffic Emissions and Health Risk Calculations 2023

Analysis Year = ***2023***

Vehicle Type	2019 Caltrans Vehicles (veh/day)	2023 Vehicles (veh/day)
Total	**22,390**	**23,286**

Increase From 2019	1.04
Vehicles/Direction	**11,643**
Avg Vehicles/Hour/Direction	485

Traffic Data Year = ***2019***

Project Traffic Data - Existing ADT	AADT Total	Total Truck
The Alameda and Campbell	22,390	786
	Percent of Total Vehicles	3.51%

Traffic Increase per Year (%) = *1.00%*

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
DPM_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	91.7	3.4	35	23,286

Emission Factors - DPM

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.00035			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and DPM Emissions - DPM_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	3.91%	911	5.04E-06	9	6.50%	1513	8.37E-06	17	5.58%	1299	7.19E-06
2	2.59%	603	3.33E-06	10	7.36%	1714	9.48E-06	18	3.28%	763	4.22E-06
3	2.88%	670	3.70E-06	11	6.33%	1473	8.15E-06	19	2.36%	549	3.04E-06
4	3.34%	777	4.30E-06	12	6.84%	1593	8.82E-06	20	0.92%	214	1.19E-06
5	2.19%	509	2.82E-06	13	6.15%	1433	7.93E-06	21	2.99%	696	3.85E-06
6	3.39%	790	4.37E-06	14	6.15%	1433	7.93E-06	22	4.14%	964	5.33E-06
7	5.98%	1393	7.71E-06	15	5.23%	1219	6.74E-06	23	2.47%	576	3.19E-06
8	4.66%	1085	6.00E-06	16	3.91%	911	5.04E-06	24	0.86%	201	1.11E-06
								Total		23,286	

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
PM2.5 Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
PM25_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	92	1.3	35	23,286

Emission Factors - PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.001511			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and PM2.5 Emissions - PM25_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.15%	268	6.41E-06	9	7.11%	1656	3.96E-05	17	7.38%	1720	4.11E-05
2	0.42%	97	2.32E-06	10	4.39%	1023	2.44E-05	18	8.17%	1903	4.55E-05
3	0.41%	95	2.27E-06	11	4.66%	1086	2.59E-05	19	5.70%	1326	3.17E-05
4	0.26%	61	1.46E-06	12	5.89%	1371	3.28E-05	20	4.27%	995	2.38E-05
5	0.50%	117	2.78E-06	13	6.15%	1432	3.42E-05	21	3.26%	759	1.81E-05
6	0.90%	211	5.03E-06	14	6.04%	1406	3.36E-05	22	3.30%	768	1.83E-05
7	3.79%	883	2.11E-05	15	7.01%	1633	3.90E-05	23	2.46%	573	1.37E-05
8	7.76%	1808	4.32E-05	16	7.14%	1661	3.97E-05	24	1.86%	434	1.04E-05
								Total		23,286	

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
TOG Exhaust Modeling - Roadway Links, Traffic Volumes, and TOG Exhaust Emissions
Year = **2023**

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEXH_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	92	1.3	35	23,286

Emission Factors - TOG Exhaust

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.03086			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and TOG Exhaust Emissions - TEXH_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.15%	268	1.31E-04	9	7.11%	1656	8.08E-04	17	7.38%	1720	8.39E-04
2	0.42%	97	4.74E-05	10	4.39%	1023	4.99E-04	18	8.17%	1903	9.28E-04
3	0.41%	95	4.63E-05	11	4.66%	1086	5.30E-04	19	5.70%	1326	6.47E-04
4	0.26%	61	2.99E-05	12	5.89%	1371	6.69E-04	20	4.27%	995	4.86E-04
5	0.50%	117	5.69E-05	13	6.15%	1432	6.99E-04	21	3.26%	759	3.70E-04
6	0.90%	211	1.03E-04	14	6.04%	1406	6.86E-04	22	3.30%	768	3.75E-04
7	3.79%	883	4.31E-04	15	7.01%	1633	7.97E-04	23	2.46%	573	2.79E-04
8	7.76%	1808	8.82E-04	16	7.14%	1661	8.11E-04	24	1.86%	434	2.12E-04
								Total		23,286	

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
TOG Evaporative Emissions Modeling - Roadway Links, Traffic Volumes, and TOG Evaporative Emissions
Year = 2023

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEVAP_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	92	1.3	35	23,286

Emission Factors - PM2.5 - Evaporative TOG

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle per Hour (g/hour)	1.35761			
Emissions per Vehicle per Mile (g/VMT)	0.03879			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and TOG Evaporative Emissions - TEVAP_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.15%	268	1.64E-04	9	7.11%	1656	1.02E-03	17	7.38%	1720	1.05E-03
2	0.42%	97	5.96E-05	10	4.39%	1023	6.27E-04	18	8.17%	1903	1.17E-03
3	0.41%	95	5.82E-05	11	4.66%	1086	6.66E-04	19	5.70%	1326	8.13E-04
4	0.26%	61	3.76E-05	12	5.89%	1371	8.41E-04	20	4.27%	995	6.10E-04
5	0.50%	117	7.15E-05	13	6.15%	1432	8.78E-04	21	3.26%	759	4.65E-04
6	0.90%	211	1.29E-04	14	6.04%	1406	8.62E-04	22	3.30%	768	4.71E-04
7	3.79%	883	5.42E-04	15	7.01%	1633	1.00E-03	23	2.46%	573	3.51E-04
8	7.76%	1808	1.11E-03	16	7.14%	1661	1.02E-03	24	1.86%	434	2.66E-04
								Total		23,286	

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
Fugitive Road PM2.5 Modeling - Roadway Links, Traffic Volumes, and Fugitive Road PM2.5 Emissions
Year = **2023**

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
FUG_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	92	1.3	35	23,286

Emission Factors - Fugitive PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Tire Wear - Emissions per Vehicle (g/VMT)	0.00211			
Brake Wear - Emissions per Vehicle (g/VMT)	0.01681			
Road Dust - Emissions per Vehicle (g/VMT)	0.01486			
Total Fugitive PM2.5 - Emissions per Vehicle (g/VMT)	0.03377			

Emisson Factors from CT-EMFAC2017

2023 Hourly Traffic Volumes and Fugitive PM2.5 Emissions - FUG_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.15%	268	1.43E-04	9	7.11%	1656	8.84E-04	17	7.38%	1720	9.18E-04
2	0.42%	97	5.19E-05	10	4.39%	1023	5.46E-04	18	8.17%	1903	1.02E-03
3	0.41%	95	5.07E-05	11	4.66%	1086	5.80E-04	19	5.70%	1326	7.08E-04
4	0.26%	61	3.27E-05	12	5.89%	1371	7.32E-04	20	4.27%	995	5.31E-04
5	0.50%	117	6.22E-05	13	6.15%	1432	7.65E-04	21	3.26%	759	4.05E-04
6	0.90%	211	1.12E-04	14	6.04%	1406	7.51E-04	22	3.30%	768	4.10E-04
7	3.79%	883	4.72E-04	15	7.01%	1633	8.72E-04	23	2.46%	573	3.06E-04
8	7.76%	1808	9.65E-04	16	7.14%	1661	8.87E-04	24	1.86%	434	2.32E-04
								Total		23,286	

2655 The Alameda, Santa Clara, CA - El Camino Real Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
at Preschool MEI Receptor, 1 m receptor height

Emission Year	2023
Receptor Information	Preschool MEI receptor
Number of Receptors	1
Receptor Height	1 meter
Receptor Distances	At Preschool MEI location

Meteorological Conditions	
BAQMD San Jose Airport Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

Preschool MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.00003	0.0016	0.0020

Preschool MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.0019	0.0018	0.0001

2655 The Alameda, Santa Clara, CA - El Camino Real Cancer Risk & PM2.5 Impacts at Preschool MEI - 1 meter receptor height
6 Year Preschool Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x SCAF x 1.0E6

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)
SCAF = School Child Adjustment Factor (unitless) for source operation and exposures different than 8 hours/day

Inhalation Dose = C_{air} x SAF x 8-Hr BR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air $(\mu g/m^3)$
8-Hr BR = Eight-hour breathing rate (L/kg body weight-per 8 hrs)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
8-Hr BR* =	1200	1200	250	261
A =	1	1	1	1
EF =	250	250	250	250
AT =	70	70	70	70
SCAF =	2.80	2.80	2.80	0.73

* 95th percentile 8-hr breathing rates for moderate intensity activities

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
1	1	0 - 1	2023	10	0.00003	0.0016	0.0020	0.011	0.003	0.0002	0.01
2	1	1 - 2	2024	10	0.00003	0.0016	0.0020	0.011	0.003	0.0002	0.01
3	1	2 - 3	2025	3	0.00003	0.0016	0.0020	0.001	0.0002	0.00002	0.001
4	1	3 - 4	2026	3	0.00003	0.0016	0.0020	0.001	0.0002	0.00002	0.001
5	1	4 - 5	2027	3	0.00003	0.0016	0.0020	0.001	0.0002	0.00002	0.001
6	1	5 - 6	2028	3	0.00003	0.0016	0.0020	0.001	0.0002	0.00002	0.001
Total Increased Cancer Risk								0.02	0.01	0.001	**0.03**

Maximum Hazard Index	Fugitive PM2.5	Total PM2.5
0.00001	0.002	0.002

* Children assumed to be 6 weeks through 6 years with 6 years of Roadway Exposure

CT-EMFAC2017 Emissions Factors for Santa Clara County 2025

File Name:	2655 The Alameda - Santa Clara (SF) - 2023 - Annual.EF
CT-EMFAC2017 Version:	1.0.2.27401
Run Date:	9/8/2022 14:07
Area:	Santa Clara (SF)
Analysis Year:	2025
Season:	Annual

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.015	0.502	0.498
Truck 2	0.02	0.936	0.048
Non-Truck	0.965	0.015	0.951

Road Type:	Major/Collector	
Silt Loading Factor:	CARB	0.032 g/m2
Precipitation Correction:	CARB	P = 64 days N = 365 days

Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

Pollutant Name	<= 5 mph	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph
PM2.5	0.008489	0.005501	0.00373	0.002665	0.00202	0.001628	0.001397	0.001277	0.00124
TOG	0.172619	0.113109	0.076066	0.0539	0.040836	0.03264	0.027389	0.02411	0.022258
Diesel PM	0.000788	0.00065	0.000505	0.000405	0.00035	0.000326	0.000328	0.000351	0.000395

Fleet Average Running Loss Emission Factors (grams/veh-hour)

Pollutant Name	Emission Factor
TOG	1.255395

Fleet Average Tire Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.002108

Fleet Average Brake Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.016801

Fleet Average Road Dust Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.014826

==========END==========

El Camino Real Traffic Emissions and Health Risk Calculations 2025

Analysis Year = ***2025***

Vehicle Type	2019 Caltrans Vehicles (veh/day)	2025 Vehicles (veh/day)
Total	**22,390**	**23,733**

Increase From 2019	1.06
Vehicles/Direction	**11,867**
Avg Vehicles/Hour/Direction	494

Traffic Data Year = ***2019***

Project Traffic Data - Existing ADT	AADT Total	Total Truck
The Alameda and Campbell	22,390	786
	Percent of Total Vehicles	3.51%

Traffic Increase per Year (%) = *1.00%*

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2025

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
DPM_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	91.7	3.4	35	23,733

Emission Factors - DPM

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.00033			

Emisson Factors from CT-EMFAC2017

2025 Hourly Traffic Volumes and DPM Emissions - DPM_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	3.93%	933	4.84E-06	9	6.41%	1521	7.89E-06	17	5.55%	1317	6.83E-06
2	2.62%	622	3.22E-06	10	7.36%	1747	9.06E-06	18	3.16%	750	3.89E-06
3	2.85%	676	3.51E-06	11	6.34%	1505	7.80E-06	19	2.36%	560	2.90E-06
4	3.31%	786	4.07E-06	12	6.92%	1642	8.52E-06	20	0.87%	206	1.07E-06
5	2.17%	515	2.67E-06	13	6.29%	1493	7.74E-06	21	3.09%	733	3.80E-06
6	3.36%	797	4.14E-06	14	6.23%	1479	7.67E-06	22	4.12%	978	5.07E-06
7	6.00%	1424	7.38E-06	15	5.15%	1222	6.34E-06	23	2.58%	612	3.18E-06
8	4.58%	1087	5.64E-06	16	3.84%	911	4.73E-06	24	0.92%	218	1.13E-06
								Total		23,736	

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
PM2.5 Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2025

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
PM25_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	92	1.3	35	23,733

Emission Factors - PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.001397			

Emisson Factors from CT-EMFAC2017

2025 Hourly Traffic Volumes and PM2.5 Emissions - PM25_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.15%	273	6.03E-06	9	7.11%	1687	3.73E-05	17	7.39%	1754	3.87E-05
2	0.42%	100	2.20E-06	10	4.39%	1042	2.30E-05	18	8.18%	1941	4.29E-05
3	0.41%	97	2.15E-06	11	4.66%	1106	2.44E-05	19	5.69%	1350	2.98E-05
4	0.26%	62	1.36E-06	12	5.89%	1398	3.09E-05	20	4.28%	1016	2.24E-05
5	0.50%	119	2.62E-06	13	6.15%	1460	3.22E-05	21	3.25%	771	1.70E-05
6	0.91%	216	4.77E-06	14	6.04%	1433	3.17E-05	22	3.30%	783	1.73E-05
7	3.79%	899	1.99E-05	15	7.01%	1664	3.67E-05	23	2.46%	584	1.29E-05
8	7.77%	1844	4.07E-05	16	7.14%	1695	3.74E-05	24	1.86%	441	9.75E-06
								Total		23,736	

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
TOG Exhaust Modeling - Roadway Links, Traffic Volumes, and TOG Exhaust Emissions
Year = 2025

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEXH_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	92	1.3	35	23,733

Emission Factors - TOG Exhaust

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle (g/VMT)	0.02739			

Emisson Factors from CT-EMFAC2017

2025 Hourly Traffic Volumes and TOG Exhaust Emissions - TEXH_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.15%	273	1.18E-04	9	7.11%	1687	7.31E-04	17	7.39%	1754	7.59E-04
2	0.42%	100	4.32E-05	10	4.39%	1042	4.51E-04	18	8.18%	1941	8.41E-04
3	0.41%	97	4.21E-05	11	4.66%	1106	4.79E-04	19	5.69%	1350	5.85E-04
4	0.26%	62	2.67E-05	12	5.89%	1398	6.05E-04	20	4.28%	1016	4.40E-04
5	0.50%	119	5.14E-05	13	6.15%	1460	6.32E-04	21	3.25%	771	3.34E-04
6	0.91%	216	9.35E-05	14	6.04%	1433	6.21E-04	22	3.30%	783	3.39E-04
7	3.79%	899	3.90E-04	15	7.01%	1664	7.20E-04	23	2.46%	584	2.53E-04
8	7.77%	1844	7.99E-04	16	7.14%	1695	7.34E-04	24	1.86%	441	1.91E-04
								Total		23,736	

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
TOG Evaporative Emissions Modeling - Roadway Links, Traffic Volumes, and TOG Evaporative Emissions
Year = 2025

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEVAP_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	92	1.3	35	23,733

Emission Factors - PM2.5 - Evaporative TOG

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Emissions per Vehicle per Hour (g/hour)	1.25540			
Emissions per Vehicle per Mile (g/VMT)	0.03587			

Emisson Factors from CT-EMFAC2017

2025 Hourly Traffic Volumes and TOG Evaporative Emissions - TEVAP_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.15%	273	1.55E-04	9	7.11%	1687	9.57E-04	17	7.39%	1754	9.95E-04
2	0.42%	100	5.65E-05	10	4.39%	1042	5.91E-04	18	8.18%	1941	1.10E-03
3	0.41%	97	5.52E-05	11	4.66%	1106	6.27E-04	19	5.69%	1350	7.66E-04
4	0.26%	62	3.50E-05	12	5.89%	1398	7.93E-04	20	4.28%	1016	5.76E-04
5	0.50%	119	6.73E-05	13	6.15%	1460	8.28E-04	21	3.25%	771	4.37E-04
6	0.91%	216	1.22E-04	14	6.04%	1433	8.13E-04	22	3.30%	783	4.44E-04
7	3.79%	899	5.10E-04	15	7.01%	1664	9.43E-04	23	2.46%	584	3.31E-04
8	7.77%	1844	1.05E-03	16	7.14%	1695	9.61E-04	24	1.86%	441	2.50E-04
								Total		23,736	

2655 The Alameda, Santa Clara, CA - Offsite Residential Roadway Modeling
Cumulative Operation - El Camino Real
Fugitive Road PM2.5 Modeling - Roadway Links, Traffic Volumes, and Fugitive Road PM2.5 Emissions
Year = **2025**

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
FUG_ECR	El Camino Real Northbound/Southbound	NB/SB	6	91.6	0.06	27.9	92	1.3	35	23,733

Emission Factors - Fugitive PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	35			
Tire Wear - Emissions per Vehicle (g/VMT)	0.00211			
Brake Wear - Emissions per Vehicle (g/VMT)	0.01680			
Road Dust - Emissions per Vehicle (g/VMT)	0.01483			
Total Fugitive PM2.5 - Emissions per Vehicle (g/VMT)	0.03374			

Emisson Factors from CT-EMFAC2017

2025 Hourly Traffic Volumes and Fugitive PM2.5 Emissions - FUG_ECR

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.15%	273	1.46E-04	9	7.11%	1687	9.00E-04	17	7.39%	1754	9.35E-04
2	0.42%	100	5.32E-05	10	4.39%	1042	5.56E-04	18	8.18%	1941	1.04E-03
3	0.41%	97	5.19E-05	11	4.66%	1106	5.90E-04	19	5.69%	1350	7.20E-04
4	0.26%	62	3.29E-05	12	5.89%	1398	7.46E-04	20	4.28%	1016	5.42E-04
5	0.50%	119	6.33E-05	13	6.15%	1460	7.79E-04	21	3.25%	771	4.11E-04
6	0.91%	216	1.15E-04	14	6.04%	1433	7.65E-04	22	3.30%	783	4.18E-04
7	3.79%	899	4.80E-04	15	7.01%	1664	8.87E-04	23	2.46%	584	3.11E-04
8	7.77%	1844	9.84E-04	16	7.14%	1695	9.04E-04	24	1.86%	441	2.35E-04
								Total		23,736	

2655 The Alameda, Santa Clara, CA - El Camino Real Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site 1st & 2nd Levels of Residential Receptors
- At 1.5m (1st Fl) and 6.4m (2nd Fl) receptor heights

Emission Year	2025
Receptor Information	Maximum On-Site Receptor
Number of Receptors	36
Receptor Height	1st & 2nd Level of Residential Receptors
Receptor Distances	7 meter grid spacing in residential areas

Meteorological Conditions	
BAQMD San Jose Airport Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Wind Direction	Variable

On-Site Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)			
	DPM	Exhaust TOG	Evaporative TOG	
2013-2017	0.00004	0.0019	0.0025	1st Level of Res Receps
2013-2017	0.00003	0.0017	0.0023	2nd Level of Res Receps

On-Site PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)			
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5	
2013-2017	0.0025	0.0024	0.0001	1st Level of Res Receps
2013-2017	0.0022	0.0021	0.0001	2nd Level of Res Receps

2655 The Alameda, Santa Clara, CA - El Camino Real Cancer Risk & PM2.5
Impacts at On-Site 1st Level of Residential Receptors - 1.5 m (1st Fl) receptor heights
30 Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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} x DBR x A x (EF/365) x 10^{-6}

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

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2025	10	0.00004	0.0019	0.0025	0.0005	0.0001	0.0000	0.001
1	1	0 - 1	2025	10	0.00004	0.0019	0.0025	0.0066	0.0018	0.0001	0.009
2	1	1 - 2	2026	10	0.00004	0.0019	0.0025	0.0066	0.0018	0.0001	0.009
3	1	2 - 3	2027	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
4	1	3 - 4	2028	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
5	1	4 - 5	2029	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
6	1	5 - 6	2030	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
7	1	6 - 7	2031	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
8	1	7 - 8	2032	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
9	1	8 - 9	2033	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
10	1	9 - 10	2034	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
11	1	10 - 11	2035	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
12	1	11 - 12	2036	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
13	1	12 - 13	2037	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
14	1	13 - 14	2038	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
15	1	14 - 15	2039	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
16	1	15 - 16	2040	3	0.00004	0.0019	0.0025	0.0010	0.0003	0.0000	0.001
17	1	16-17	2041	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
18	1	17-18	2042	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
19	1	18-19	2043	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
20	1	19-20	2044	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
21	1	20-21	2045	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
22	1	21-22	2046	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
23	1	22-23	2047	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
24	1	23-24	2048	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
25	1	24-25	2049	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
26	1	25-26	2050	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
27	1	26-27	2051	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
28	1	27-28	2052	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
29	1	28-29	2053	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
30	1	29-30	2054	1	0.00004	0.0019	0.0025	0.0001	0.0000	0.0000	0.000
Total Increased Cancer Risk								0.03	0.008	0.001	**0.04**

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.00001	0.002	0.002

* Third trimester of pregnancy

2655 The Alameda, Santa Clara, CA - El Camino Real Cancer Risk & PM2.5
Impacts at On-Site 2nd Level of Residential Receptors - 6.4 m (2nd Fl) receptor heights
30 Year Residential Exposure

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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} x DBR x A x (EF/365) x 10^{-6}

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

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	TOTAL
0	0.25	-0.25 - 0*	2025	10	0.00003	0.0017	0.0023	0.0004	0.0001	0.00001	0.001
1	1	0 - 1	2025	10	0.00003	0.0017	0.0023	0.0049	0.0016	0.00013	0.007
2	1	1 - 2	2026	10	0.00003	0.0017	0.0023	0.0049	0.0016	0.00013	0.007
3	1	2 - 3	2027	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
4	1	3 - 4	2028	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
5	1	4 - 5	2029	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
6	1	5 - 6	2030	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
7	1	6 - 7	2031	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
8	1	7 - 8	2032	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
9	1	8 - 9	2033	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
10	1	9 - 10	2034	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
11	1	10 - 11	2035	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
12	1	11 - 12	2036	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
13	1	12 - 13	2037	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
14	1	13 - 14	2038	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
15	1	14 - 15	2039	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
16	1	15 - 16	2040	3	0.00003	0.0017	0.0023	0.0008	0.0003	0.00002	0.001
17	1	16-17	2041	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
18	1	17-18	2042	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
19	1	18-19	2043	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
20	1	19-20	2044	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
21	1	20-21	2045	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
22	1	21-22	2046	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
23	1	22-23	2047	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
24	1	23-24	2048	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
25	1	24-25	2049	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
26	1	25-26	2050	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
27	1	26-27	2051	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
28	1	27-28	2052	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
29	1	28-29	2053	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
30	1	29-30	2054	1	0.00003	0.0017	0.0023	0.0001	0.0000	0.00000	0.000
Total Increased Cancer Risk								0.02	0.007	0.001	**0.03**

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.00001	0.002	0.002

* Third trimester of pregnancy

Bay Area Air Quality Management District

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD

This form is to be used with the BAAQMD's Google Earth stationary source screening tables.

Click here for guidance on coducting risk & hazard screening, including roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.

Click here for District's Recommended Methods for Screening and Modeling Local Risks and Hazards document.

Table A: Requester Contact Information

Date of Request	**8/12/2022**
Contact Name	Casey Divine
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-0400 x103
Email	cdivine@illingworthrodkin.com
Project Name	2655 The Alameda
Address	2655 The Alameda
City	Santa Clara
County	Santa Clara
Type (residential, commercial, mixed use, industrial, etc.)	Residential
Project Size (# of units or building square feet)	39 du
Comments:	

For Air District assistance, the following steps must be completed:

1. Complete all the contact and project information requested in Table A ncomplete forms will not be processed. Please include a project site map.

2. Download and install the free program Google Earth, **http://www.google.com/earth/download/ge/,** and then download the county specific Google Earth stationary source application files from the District's website, **http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.** The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's Information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.

3. Find the project site in Google Earth by inputting the site's address in the Google Earth search box.

4. Identify stationary sources within at least a 1000ft radius of project site. Verify that the location of the source on the map matches with the source's address in the Information Table, by using the Google Earth address search box to confirm the source's address location. Please report any mapping errors to the District.

5. List the stationary source information in Table B lue section only.

6. Note that a small percentage of the stationa sources ve Health Risk Screening Assessment (HRSA) data INSTEAD of screening level data. These sources will be noted by an asterisk next to the Plant Name (Map B on right). If HRSA values are presented, these values have already been modeled and cannot be adjusted further.

7. Email this completed form to District staff. District staff will provide the most recent risk, hazard, and PM2.5 data that are available for the source(s). If this information or data are not available, source emissions data will be provided. Staff will respond to inquiries within three weeks.

Note that a public records request received for the same stationary source information will cancel the processing of your SSIF request.

Submit forms, maps, and questions to Matthew Hanson at 415-749-8733, or mhanson@baaqmd.gov

Table B: Google Earth data

Distance from Receptor (feet) or MEI[1]	Plant No.	Facility Name	Address	Cancer Risk[2]	Hazard Risk[2]	$PM_{2.5}$[2]	Source No.[3]	Type of Source[4]	Fuel Code[5]	Status/Comments	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
1000	15397_1	Santa Clara University	500 El Camino Real	1.81	0.003	0.002		Generator	Generator	2020 Dataset	0.04	0.07	0.0001	0.0001
970	15397_10	Santa Clara University	500 El Camino Real	4.20	0.01	0.01		Generator	Generator	2020 Dataset	0.04	0.17	0.0003	0.0002
950	15397_12	Santa Clara University	500 El Camino Real	11.71	0.02	0.01		Generator	Generator	2020 Dataset	0.04	0.47	0.001	0.001
980	15397_13	Santa Clara University	500 El Camino Real	7.20	0.01	0.01		Generator	Generator	2020 Dataset	0.04	0.29	0.0004	0.0004
910	15397_14	Santa Clara University	500 El Camino Real	2.44	0.004	0.003		Generator	Generator	2020 Dataset	0.04	0.10	0.0002	0.0001
870	15397_16	Santa Clara University	500 El Camino Real	6.48	0.01	0.01		Generator	Generator	2020 Dataset	0.05	0.32	0.001	0.0004
510	15397_18	Santa Clara University	500 El Camino Real	2.17	0.01	0.003		Generator	Generator	2020 Dataset	0.10	0.22	0.001	0.0003
760	15397_19	Santa Clara University	500 El Camino Real	1.51	0.003	0.002		Generator	Generator	2020 Dataset	0.06	0.09	0.0002	0.0001
370	15397_21	Santa Clara University	500 El Camino Real	1.73	0.003	0.002		Generator	Generator	2020 Dataset	0.18	0.31	0.001	0.0004
575	15397_23	Santa Clara University	500 El Camino Real	1.58	0.003	0.002		Generator	Generator	2020 Dataset	0.09	0.14	0.0003	0.0002

Preschool MEI

Project Site

Distance from Receptor (feet) or MEI[1]	FACID (Plant No.)	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
720	15397_1	0.07	0.13	0.0002	0.0002
990	15397_10	0.04	0.17	0.0003	0.0002
585	15397_12	0.09	1.05	0.002	0.001
970	15397_13	0.04	0.29	0.0004	0.0004
1000	15397_14	0.04	0.10	0.0002	0.0001
990	15397_16	0.04	0.26	0.0004	0.0003
490	15397_18	0.12	0.26	0.001	0.0003
710	15397_19	0.07	0.11	0.0002	0.0001
485	15397_21	0.12	0.21	0.0004	0.0003
690	15397_23	0.08	0.13	0.0002	0.0002

Footnotes:

1. Maximally exposed individual

2. These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant Information Table.
3. Each plant may have multiple permits and sources.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
5. Fuel codes: 98 = diesel, 189 = Natural Gas.
6. If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed here.
7. The date that the HRSA was completed.
8. Engineer who completed the HRSA. For District purposes only.
9. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
10. The HRSA "Chronic Health" number represents the Hazard Index.
11. Further information about common sources:
    a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
    b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard index of 0.003 or
    c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010. Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
    d. Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period, but instead should reflect
    e. Gas stations can be adjusted using BAAQMD's Gas Station Distance Mulitplier worksheet.
    f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
    g. This spray booth is considered to be insignificant.

Date last updated:
03/13/2018

Gasoline Dispensing Facility (GDF) Distance Multiplier Tool: This distance multiplier tool refines the screening values for cancer risk and chronic hazard index found in the District's Stationary Source Screening Analysis Tool for GDF's, to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Gas Station

Distance (meters)	Distance (feet)	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard
0	0.0	1.000		0.0000
5	16.4	1.000		0.0000
10	32.8	1.000		0.0000
15	49.2	1.000		0.0000
20	65.6	1.000		0.0000
25	82.0	0.728		0.0000
30	98.4	0.559		0.0000
35	114.8	0.445		0.0000
40	131.2	0.365		0.0000
45	147.6	0.305		0.0000
50	164.0	0.260		0.0000
55	180.4	0.225		0.0000
60	196.9	0.197		0.0000
65	213.3	0.174		0.0000
70	229.7	0.155		0.0000
75	246.1	0.139		0.0000
80	262.5	0.126		0.0000
85	278.9	0.114		0.0000
90	295.3	0.104		0.0000
95	311.7	0.096		0.0000
100	328.1	0.088		0.0000
105	344.5	0.082		0.0000
110	360.9	0.076		0.0000
115	377.3	0.071		0.0000
120	393.7	0.066		0.0000
125	410.1	0.062		0.0000
130	426.5	0.058		0.0000
135	442.9	0.055		0.0000
140	459.3	0.052		0.0000
145	475.7	0.049		0.0000
150	492.1	0.046		0.0000
155	508.5	0.044		0.0000
160	524.9	0.042		0.0000
165	541.3	0.040		0.0000
170	557.7	0.038		0.0000
175	574.1	0.036		0.0000
180	590.6	0.034		0.0000
185	607.0	0.033		0.0000
190	623.4	0.031		0.0000
195	639.8	0.030		0.0000
200	656.2	0.029		0.0000
205	672.6	0.028		0.0000
210	689.0	0.027		0.0000
215	705.4	0.026		0.0000
220	721.8	0.025		0.0000
225	738.2	0.024		0.0000
230	754.6	0.023		0.0000
235	771.0	0.022		0.0000
240	787.4	0.022		0.0000
245	803.8	0.021		0.0000
250	820.2	0.020		0.0000
255	836.6	0.020		0.0000
260	853.0	0.019		0.0000
265	869.4	0.018		0.0000
270	885.8	0.018		0.0000
275	902.2	0.017		0.0000
280	918.6	0.017		0.0000
285	935.0	0.016		0.0000
290	951.4	0.016		0.0000
295	967.8	0.015		0.0000
300	984.3	0.015		0.0000

Diesel Internal Combustion (IC) Engine Distance Multiplier Tool: This distance multiplier tool refines the screening values for cancer risk and PM2.5 concentrations found in the District's Stationary Source Screening Analysis Tool for permitted facilities which contain only diesel IC engines, to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Diesel Backup Generator

Distance (meters)	Distance (feet)	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard	Enter PM2.5 Concentration	Adjusted PM2.5 Concentration
0	0.0	1.000		0		0
5	16.4	1.000		0		0
10	32.8	1.000		0		0
15	49.2	1.000		0		0
20	65.6	1.000		0		0
25	82.0	0.85		0		0
30	98.4	0.73		0		0
35	114.8	0.64		0		0
40	131.2	0.58		0		0
50	164.0	0.5		0		0
60	196.9	0.41		0		0
70	229.7	0.31		0		0
80	262.5	0.28		0		0
90	295.3	0.25		0		0
100	328.1	0.22		0		0
110	360.9	0.18		0		0
120	393.7	0.16		0		0
130	426.5	0.15		0		0
140	459.3	0.14		0		0
150	492.1	0.12		0		0
160	524.9	0.1		0		0
180	590.6	0.09		0		0
200	656.2	0.08		0		0
220	721.8	0.07		0		0
240	787.4	0.06		0		0
260	853.0	0.05		0		0
280	918.6	0.04		0		0

Generic Distance Multiplier Tool: This distance multiplier tool refines the screening values to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Generic Case

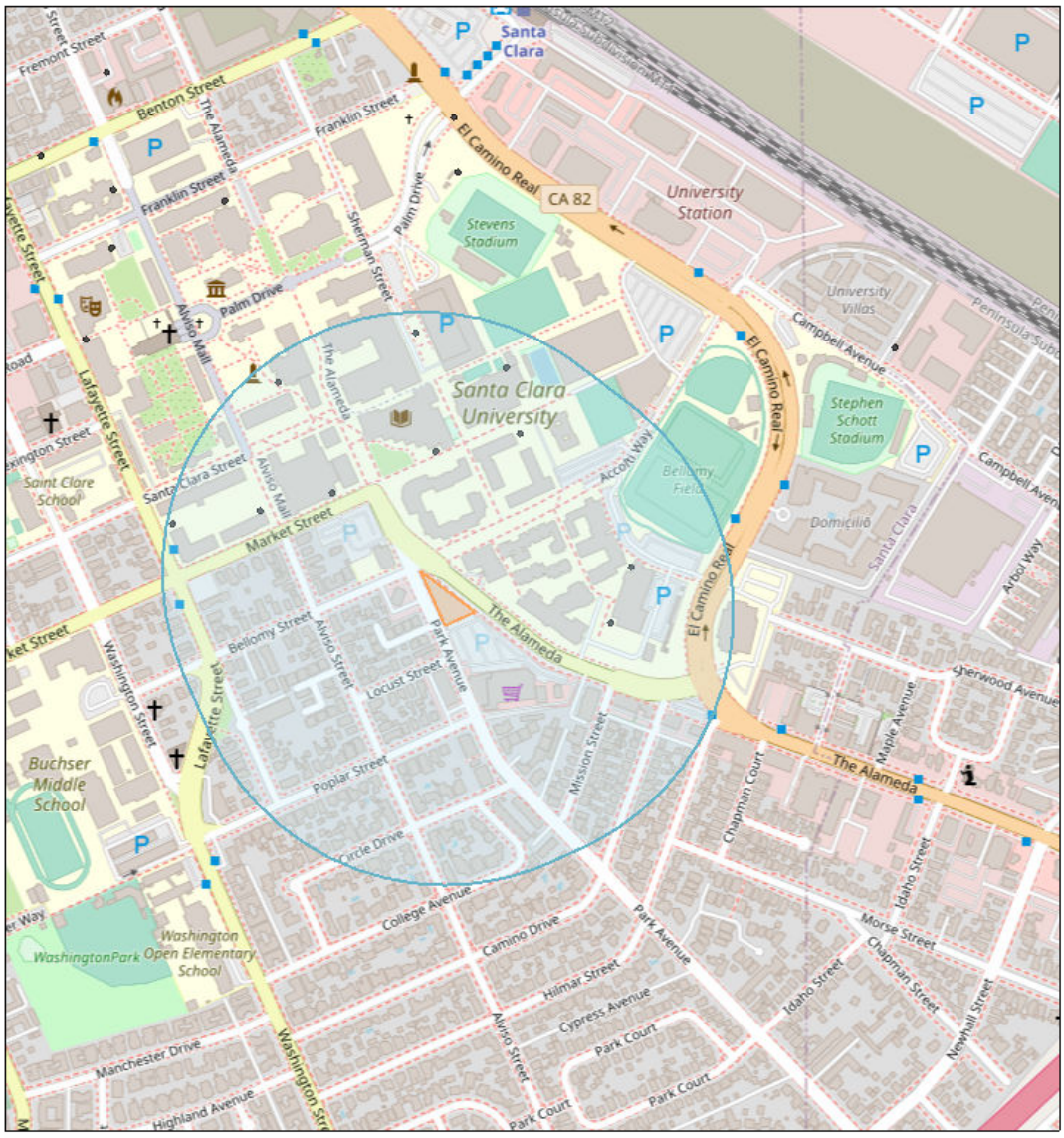
Distance (meters)	Distance (feet)	Multiplier
0	0.0	1.000
5	16.4	1.000
10	32.8	0.883
15	49.2	0.855
20	65.6	0.827
25	82.0	0.801
30	98.4	0.775
35	114.8	0.750
40	131.2	0.726
45	147.6	0.702
50	164.0	0.679
55	180.4	0.658
60	196.9	0.636
65	213.3	0.616
70	229.7	0.596
75	246.1	0.577
80	262.5	0.558
85	278.9	0.540
90	295.3	0.523
95	311.7	0.506
100	328.1	0.489
105	344.5	0.474
110	360.9	0.458
115	377.3	0.444
120	393.7	0.429
125	410.1	0.415
130	426.5	0.402
135	442.9	0.389
140	459.3	0.376
145	475.7	0.364
150	492.1	0.353
155	508.5	0.341
160	524.9	0.330
165	541.3	0.319
170	557.7	0.309
175	574.1	0.299
180	590.6	0.290
185	607.0	0.280
190	623.4	0.271
195	639.8	0.262
200	656.2	0.254
205	672.6	0.246
210	689.0	0.238
215	705.4	0.230
220	721.8	0.223
225	738.2	0.216
230	754.6	0.209
235	771.0	0.202
240	787.4	0.195
245	803.8	0.189
250	820.2	0.183
255	836.6	0.177
260	853.0	0.171
265	869.4	0.166
270	885.8	0.160
275	902.2	0.155
280	918.6	0.150
285	935.0	0.145
290	951.4	0.141
295	967.8	0.136
300	984.3	0.132

Screening Report

Area of Interest (AOI) Information

Area : 4,567,713.7 ft²

Aug 12 2022 14:47:09 Pacific Daylight Time



• Permitted Stationary Sources

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Map data © OpenStreetMap contributors, CC-BY-SA

Summary

Name	Count	Area(ft²)	Length(ft)
Permitted Stationary Sources	10	N/A	N/A

Permitted Stationary Sources

#	FacID	FacName	Address	City	Street
1	15397_1	Santa Clara University	500 El Camino Real	Santa Clara	CA
2	15397_10	Santa Clara University	500 El Camino Real	Santa Clara	CA
3	15397_12	Santa Clara University	500 El Camino Real	Santa Clara	CA
4	15397_13	Santa Clara University	500 El Camino Real	Santa Clara	CA
5	15397_14	Santa Clara University	500 El Camino Real	Santa Clara	CA
6	15397_16	Santa Clara University	500 El Camino Real	Santa Clara	CA
7	15397_18	Santa Clara University	500 El Camino Real	Santa Clara	CA
8	15397_19	Santa Clara University	500 El Camino Real	Santa Clara	CA
9	15397_21	Santa Clara University	500 El Camino Real	Santa Clara	CA
10	15397_23	Santa Clara University	500 El Camino Real	Santa Clara	CA

#	Zip	County	Latitude	Longitude	Details
1	95,053.00	Santa Clara	37.35	-121.93	Generator
2	95,053.00	Santa Clara	37.35	-121.94	Generator
3	95,053.00	Santa Clara	37.35	-121.93	Generator
4	95,053.00	Santa Clara	37.35	-121.94	Generator
5	95,053.00	Santa Clara	37.35	-121.94	Generator
6	95,053.00	Santa Clara	37.35	-121.94	Generator
7	95,053.00	Santa Clara	37.35	-121.94	Generator
8	95,053.00	Santa Clara	37.35	-121.94	Generator
9	95,053.00	Santa Clara	37.35	-121.94	Generator
10	95,053.00	Santa Clara	37.35	-121.94	Generator

#	NAICS	Sector	Sub_Sector	Industry	ChronicHI
1	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0028061
2	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0064942
3	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0181196
4	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0111443
5	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0037682
6	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0100219
7	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0070093
8	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0028516
9	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0034340
10	611,310.00	Educational Services	Educational Services	Colleges, Universities, and Professional Schools	0.0028062

#	PM2_5	Cancer Risk {expression/expr0}	Chronic Hazard Index {expression/expr1}	PM2.5 {expression/expr2}	Count
1	0.0023128	1.814	0.003	0.002	1
2	0.0053524	4.197	0.006	0.005	1
3	0.0149337	11.71	0.018	0.015	1
4	0.0091849	7.202	0.011	0.009	1
5	0.0031057	2.435	0.004	0.003	1
6	0.0082598	6.477	0.01	0.008	1
7	0.0026680	2.173	0.007	0.003	1
8	0.0019092	1.509	0.003	0.002	1
9	0.0021901	1.734	0.003	0.002	1
10	0.0020021	1.578	0.003	0.002	1

NOTE: A larger buffer than 1000 feet may be warranted depending on proximity to significant sources.

TETRA TECH

Geotechnical Engineering ● Engineering Geology

DUE DILIGENCE – PRIVILEGED AND CONFIDENTIAL

Geotechnical Design Report

PROPOSED RESIDENTIAL / RETAIL DEVELOPMENT

2655 The Alameda
Santa Clara, California



Prepared for:

Kapital Partners, LLC
1999 S. Bascom Ave, Suite 250
Campbell, CA 95008

Prepared by:

Tetra Tech
21700 Copley Drive, Suite #200
Diamond Bar, California 91765

Project No. TET 22-235E
May 26, 2022

TETRA TECH

Project No. TET 22-235E
May 26, 2022

Ms. Anjuli Habbas
Kapital Partners, LLC
1999 S. Bascom Ave, Suite 250
Campbell, CA 95008

Subject: **DUE DILIGENCE – PRIVILEGED AND CONFIDENTIAL**
GEOTECHNICAL DESIGN REPORT
PROPOSED RESIDENTIAL / RETAIL DEVELOPMENT
2655 The Alameda
Santa Clara, CA 95050

Dear Ms. Habbas:

Tetra Tech is pleased to submit the results of our geotechnical investigation for the proposed residential / retail development located at 2655 The Alameda in the City of Santa Clara, California. The purpose of our investigation was to evaluate the subsurface conditions at the property and to provide recommendations for design and construction of the proposed development. We understand that this information will be utilized for your due-diligence assessment of the property as well as for future design and construction purposes should you continue to move forward with the project. This report includes a brief description of the proposed development, a discussion regarding the field exploration and laboratory testing, a description of subsurface conditions, a discussion on engineering seismology and geological hazards, and provides geotechnical conclusions and recommendations. The appendices to the report include logs of our exploratory borings, results of laboratory tests, seismic demand, and liquefaction evaluation.

We appreciate the opportunity to provide our professional services on this project. If you have any questions regarding this report or if we can be of further service, please do not hesitate to contact the undersigned.

Respectfully submitted,
Tetra Tech

Fernando Cuenca, PhD, GE
Senior Engineer



Yong Lang Li, PhD, GE
Senior Engineer



Michael O. Spira, CEG
Supervising Engineering Geologist



Distribution:
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1. INTRODUCTION

This report presents the results of Tetra Tech's geotechnical engineering evaluation and design recommendations for the proposed residential / retail development at 2655 The Alameda in the City of Santa Clara, Santa Clara County, California. The location of the site is shown on Figure 1 – Site Location Map.

The purpose of our investigation was to evaluate the subsurface conditions at the property and to provide recommendations for the design and construction of the proposed development. This report includes a brief description of the proposed development, a discussion of our field exploration, laboratory testing results, a description of subsurface conditions, a discussion regarding engineering seismology and geological hazards, and provides geotechnical conclusions and recommendations for design and construction of the proposed development.

2. SCOPE OF SERVICES

Tetra Tech's scope of services for this project consisted of the following tasks:

- Review the provided environmental reports for the site.
- Review aerial photographs, geotechnical literature, geologic maps, and seismic hazard maps relevant to the subject site.
- Notify Underground Service Alert (USA) prior to drilling for clearance of underground utilities.
- Procure a drilling permit from the Santa Clara Valley Water District.
- Perform a subsurface exploration consisting of drilling and sampling 2 soil borings to a depth of 31.5 and 81.5 feet.
- Conduct laboratory testing of selected samples recovered from the exploratory borings to evaluate geotechnical properties of the on-site soils.
- Process and evaluate the collected geotechnical data for use in developing geotechnical recommendations including the following items:
    - General subsurface conditions and description of types, distribution, and engineering characteristics of subsurface materials,
    - Liquefaction potential and seismic settlement of the on-site granular materials,
    - Sensitivity of the on-site fine-grained materials,
    - Suitability of on-site soils for the support of structures,
    - Seismic design parameters in accordance with 2019 California Building Code (2019 CBC),
    - Corrosion potential of the on-site soils to buried concrete and steel.
- Develop design and construction recommendations for the following items:
    - Temporary shoring,
    - Mat foundations including allowable bearing pressures, lateral resistance, and settlement estimates,
    - Static and seismic lateral earth pressures on basement walls,
    - Portland cement concrete pavement section for driveways.
- Prepare this report documenting reference maps and illustrations, collected field and laboratory data, and geotechnical recommendations for the design and construction of the proposed development.

3. SITE DESCRIPTION

The site is a triangular-shaped 0.4-acre property bordered by The Alameda to the northeast, by Park Avenue to the southwest and by the existing Safeway Center parking lot to the southeast. The site is currently a vacant lot that is covered with dirt and with chain-link fencing along the perimeter of the site. Groundwater and vapor monitoring wells associated with previous environmental studies are also present at the site.

Topographically, the site is relatively level. However, the general site vicinity slopes very gently to the northeast. Based on Google earth imagery, the site elevation is approximately 74 to 75 feet.

Based on our review of background environmental information provided to us, the site was previously occupied by a former Unocal-branded service station that operated from approximately 1930 to 1993. In March of 1993 all the above- and below-ground facilities were removed. These facilities reportedly included two 10,000-gallon gasoline underground storage tanks (USTs), one 8,000-gallon diesel UST, a 500-gallon waste-oil UST, an additional 100-gallon storage tank, a clarifier, product lines, three product dispenser islands, a station building and some other associated improvements. Excavations up to 14.5 feet deep were reportedly made in the area where the fuel storage tanks had been located, and up to 3.5 feet deep in the area where the product lines and dispenser islands had been located. These excavations were reportedly backfilled with imported soil materials. However, specific documentation regarding the placement and compaction of the imported soil material was not included in the reviewed documents. The approximate excavation limits associated with the removal of the UST's and previous underground improvements are shown on Figure 2 – Former Excavation Limit Map.

4. PROJECT DESCRIPTION

The proposed development will entail the construction of a mixed-use residential / retail building that will occupy most of the site. Based on the preliminary development plans shown in Figures 3A, 3B and 3C – Preliminary Development Plan, the proposed building will consist of a 4-story structure with a 14,143-square-foot subterranean parking garage under the footprint of the building. The street level grade will be used for retail and residential units. Levels 2 through 4 will be used for residential units. Total building height, including roof parapet, is approximately 52 to 55 feet. The horizontal setback for the below grade parking garage adjacent to The Alameda and Park Avenue is 4 feet. To the southeast, along the boundary with the Safeway Center parking lot, the parking garage is to be positioned along the property line.

Neither site grading nor foundation plans have been prepared for the project at this time. However, based on the preliminary development plan, future construction for the building and underground parking garage will generally require excavations of approximately 12 to 15 feet over much of the site with maximum excavation depths extending in localized areas up to approximately 20 feet to accommodate elevator pits and other utilitarian infrastructure. The proposed excavations will remove any uncertified fill within the area. Considering that the proposed building structure is adjacent to or along the property line, a shoring system will be required to support the temporary excavations.

Considering the underlying geologic conditions of the site, as presented in the Geology and Subsurface Condition section of this report, we anticipate that the building will be supported on a structural mat foundation. The mat foundation will likely be occupying almost the entire triangular lot with maximum dimensions of approximately 250 feet by 137 feet by 283 feet. Foundation pressures are not expected to exceed 2 ksf although at the time of writing no information regarding structural loads is available. Once the actual dimensions of the building and the foundation loads are finalized, this office should be contacted to verify that the recommendations provided herein are still applicable.

5. FIELD INVESTIGATION

The subsurface soil and groundwater conditions were explored by Tetra Tech on April 15, 2022 and included drilling, logging, and sampling of 2 exploratory borings, Tt-1 and Tt-2. The locations of the 2 borings are shown on Figure 4 – Boring Locations Map. Relevant boring information including latitude and longitude, approximate ground surface elevation, and exploration depth is summarized in Table 1 below.

Table 1
Soil Boring Locations Information

Boring No.	General Location	Latitude (degrees)	Longitude (degrees)	Approximate Depth (ft)	Approximate Ground Elevation (ft)
Tt-1	North area of site	37.346365	-121.937575	31.5	75
Tt-2	East-central portion of site	37.346236	-121.937266	81.5	75

Prior to initiation of the field exploration program, a field reconnaissance was conducted to observe surface conditions and to mark the locations of the planned subsurface exploration. Underground Service Alert was notified of the exploratory boring locations at least 48 hours prior to drilling. A drilling permit was also obtained through the Santa Clara Valley Water District.

The borings were excavated using a truck-mounted CME 85 drill rig equipped with 8-inch diameter hollow-stem augers. Bulk, driven California-type ring samples, and Standard Penetration Test (SPT) samples were collected during the drilling and transported to a laboratory for testing. The SPT sampler consisted of a 2-inch outside diameter, 1.4-inch inside diameter split barrel without liners, while the California-type sampler consisted of a 3-inch O.D., and a 2.4-inch I.D. split barrel. The interior of the California-type sampler was lined with 1-inch-long brass rings.

SPT testing was performed using an SPT sampler driven by an automatic 140-pound hammer with a drop of 30 inches in general accordance with ASTM D1586. The total number of hammer blows required to drive the sampler the final 12 inches is termed the "blowcount." The hammer calibration record indicated an average energy transfer ratio of 75 percent. Ring-type samples were collected by driving the California-type sampler using the same equipment as for the SPTs. Sampling was generally carried out at 2.5- or 5-foot vertical intervals.

The borings were surface logged by a Geologist in general accordance with the visual-manual procedure for description and identification of soils per ASTM D2488. The Geologist prepared the recovered samples for subsequent laboratory testing. At the completion of drilling, the borings were backfilled with cement-bentonite grout. The excavated materials were drummed and disposed of at an approved disposal facility. The exploratory boring logs are presented in Appendix A – Logs of Exploratory Borings.

6. LABORATORY TESTING

Laboratory tests were performed on selected samples recovered from the borings to aid in the classification of soils and to evaluate pertinent engineering properties of the foundation soils. The following tests were performed:

- In-situ Moisture Content and Dry Density, ASTM D2937;
- Percent Passing #200, ASTM D1140;
- Atterberg Limits, ASTM D4318;
- Expansion Index, ASTM D4829;
- Consolidation, ASTM D2435;
- Direct Shear, ASTM D3080; and
- Corrosion Testing in Soils:
  - pH and resistivity, CTM 643;
  - Sulphates, CTM 417; and
  - Chlorides, CTM 422.

Laboratory testing was performed in general accordance with applicable ASTM Standards and California Test Methods. Results of laboratory tests are presented in Appendix B – Results of Laboratory Testing. For ease of referral to the soil profile, selected laboratory results have been included on the boring logs in Appendix A.

7. GEOLOGIC AND SUBSURFACE CONDITIONS

Regionally, the site is in the Santa Clara Valley, which extends southeastward from San Francisco Bay and is a northwest / southeast trending valley within the Coast Ranges Geomorphic Province of Northern California. The Santa Clara Valley is a broad alluvium-filled basin located between the Santa Cruz Mountains to the southwest and the Diablo Range to the northeast. The sediments on the valley floor, as shown on the Figure 5 – Regional Geologic Map, are generally comprised of alluvial sands, silts, clays, and gravels associated with Holocene-age alluvial fan, levee, and active stream channel deposits, and with marine estuary deposits located along the bay margins. Major right-lateral strike-slips faults occur on either side of the Santa Clara Valley. These faults include the San Andreas fault on the southwest side of the valley and the Hayward and Calaveras faults on the northeast side of the valley.

The subsurface soils encountered during Tetra Tech's field exploration, consisted of undocumented artificial fill soils over native alluvial deposits. The soils were found to be generally consistent with the materials encountered during previous environmental studies at the site. Detailed descriptions of the soil units encountered during our field exploration are presented below and in the boring logs included Appendix A.

7.1. Undocumented Artificial Fill (af)

Undocumented artificial fill soils associated with previous site development and the demolition of former above- and below-ground site improvements are present over much of the site. These fills, based on our research, consist of both locally derived materials as well as imported fill soils. The locally derived artificial fill materials, as observed in exploratory boring Tt-1, were encountered to a depth of approximately 3 feet and consisted of brown clayey sands that were generally dry to damp and contained trace amounts of concrete fragments less than 4 inches in size. Imported fill soils were not encountered during our field exploration. They were reportedly used during backfill operations associated with the removal of former USTs and other assorted underground improvement excavations at the site in 1993. According to the referenced report by Pacific Environmental Group, Inc. (1994), the backfilled soils were up 14.5 feet deep. Specific documentation concerning the characteristics of these fills and backfill operations were not included in their report. The approximate limits of the former excavations that were backfilled with imported soils, as presented in the referenced report by Pacific Environmental Group, Inc. (1994), are shown on Figure 2.

7.2. Alluvium (Qya)

Quaternary-age alluvial deposits underlie the fill materials throughout the entire site and were encountered to the maximum explored depth of 81.5 feet during our field exploration. The alluvial soils encountered within the upper 5 feet to 12 feet of the ground surface generally consisted of brown sandy clays that were damp, soft to stiff, and contained gravels up to 3 inches in diameter. Below the upper alluvium to a depth of approximately 55 feet, the encountered alluvial soils consisted primarily of firm to stiff lean clays that were olive gray, yellowish brown, blueish gray, and black in color, and moist to wet. Also included in this sequence were occasional discontinuous silt, sand, and clayey sand layers. From about 55 feet to 73 feet in depth, the alluvial soils consisted

primarily of interlayered clayey sand, silt, lean clay, and silty sand. These soils were generally blueish gray in color, medium dense or very stiff, and wet. Poorly graded gravels with coarse-grained sands were encountered in boring Tt-2 at a depth between approximately 73 and 81.5 feet. These materials were olive in color, very dense, and wet.

7.3. Groundwater

At the time of our exploration, groundwater was not noted in exploratory boring Tt-1 to a depth of 31.5 feet prior to backfill. However, exploratory boring Tt-2 had groundwater at a depth of about 18.5 feet after being left open for several hours prior to backfill. Groundwater depths measured by Tetra Tech at the existing groundwater monitoring wells on April 15, 2022 varied from about 16 to 20 feet. Based on our review of the available groundwater monitoring well data since 1993, groundwater levels beneath the site have fluctuated substantially over the years with measured groundwater depths as shallow as 4 feet in March 2019 and as deep as 28 feet in March 2015. Mapping by the State of California (California Department of Conservation, Division of Mines and Geology, 2002) for the San Jose West 7.5-minute Quadrangle indicates that the historic high groundwater level at the site is at a depth of about 10 feet (see Figure 6 – Historic High Groundwater Map).

A groundwater depth of 4 feet should be considered for the design of the proposed building. Furthermore, groundwater levels may fluctuate due to seasonal variations, rainfall, irrigation, or other factors and will need to be considered during future grading operations and site construction.

8. GEOLOGIC HAZARDS

8.1. General Seismic Setting

The Northern California region is known to be seismically active. Earthquakes occurring within approximately 60 miles of the site are generally capable of generating ground shaking of engineering significance to the proposed construction. The project area is located in the general proximity of several active faults as shown in Figure 7 – Regional Fault and Seismicity Map.

The closest active faults to the site include the Monte Vista-Shannon fault located approximately 6.57 miles southwest of the site, the Hayward-Rodgers Creek fault located approximately 8.85 miles north of the site, and the Calaveras fault approximately 9.81 miles to the northeast. The North San Andreas fault is the most significant fault in the area in terms of Maximum Magnitude and is located approximately 10.6 miles southwest of the site. Table 2 summarizes known active faults within a distance of engineering significance of approximately 60 miles from the project site as identified by the USGS Quaternary Fault Database and in the 2008 National Seismic Hazard Maps (https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf and https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/query_main.cfm).

8.2. Historical Earthquakes

The epicenters of a large number of historical earthquakes with a magnitude of M_w 5.0 and higher have been recorded within a 60-mile radius of site. The most significant historic earthquake near the project site was the 1906 San Francisco M_w 7.9 earthquake located about 43.7 miles northwest of the site. Table 3 summarizes historic earthquakes with a magnitude greater than M_w 6.5 within a distance of approximately 60 miles from the project site obtained using the USGS Earthquake Catalog (https://earthquake.usgs.gov/earthquakes/search/).

Table 2
Summary of Active Faults
Referenced Site Latitude and Longitude: 37.346191°, -121.937395°

Fault Name	Approximate Fault Distance to Site (miles)	Slip Sense	Maximum Moment Magnitude M_w
Monte Vista-Shannon	6.57	thrust	6.50
Hayward-Rodgers Creek	8.85	strike slip	7.33
Calaveras	9.81	strike slip	7.03
N. San Andreas	10.6	strike slip	8.05
Zayante-Vergeles	17.88	strike slip	7.00
Greenville Connected	24.19	strike slip	7.00
San Gregorio Connected	24.63	strike slip	7.50
Mount Diablo Thrust	27.19	thrust	6.70
Monterey Bay-Tularcitos	31.04	strike slip	7.30
Great Valley 7	34.99	thrust	6.90
Ortigalita	36.5	strike slip	7.10
Green Valley Connected	38.32	strike slip	6.80
Quien Sabe	42.87	strike slip	6.60
Great Valley 8	43.26	thrust	6.80
Great Valley 5, Pittsburg Kirby Hills	46.47	reverse	6.70
Rinconada	47.32	strike slip	7.50
Great Valley 9	54.99	thrust	6.80
West Napa	58.9	strike slip	6.70

Table 3
Historic Earthquakes in Northern California
Referenced Site Latitude and Longitude: 37.346191°, -121.937395°

Year	Location	Earthquake Magnitude	Epicenter Location	Distance from Site (miles)
1989	Loma Prieta	6.9 M_w	37.036°N/-121.880°W	21.6 S
1911	2 km SE of Morgan Hill	6.5 M_w	37.111°N/-121.637°W	23.2 SE
1906	San Francisco	7.9 M_w	37.750°N/-122.550°W	43.7 NW
1868	Hayward	6.8 M_L	37.700°N/-122.100°W	26.0 N-NW
1865	South of San Jose	6.5 M_w	37.200°N/-121.900°W	10.3 S
1840	Near San Juan Bautista	6.5 M_w	36.850°N/-121.500°W	41.9 SE
1838	San Francisco	7.4 M_w	37.300°N/-122.150°W	10.6 SW

Notes:
* M_w refers to Moment Magnitude scale
M_L refers to Local Magnitude scale, commonly referred to as "Richter magnitude"

8.3. Seismic Hazards and Surface Fault Rupture Potential

The engineering seismology study for the subject site included reviewing local and regional fault maps, reviewing historical earthquake data, and reviewing regulatory maps prepared by the State and local governing agencies. Specifically, the following engineering seismology issues were addressed:

8.3.1. Seismic Hazards

The Seismic Hazards Mapping Act (SHMA) of 1990 directs the California Geological Survey (CGS, formerly California Department of Conservation, Division of Mines and Geology (CDMG)) to identify and map areas prone to earthquake hazards of liquefaction, earthquake-induced landslides and amplified ground shaking.

Maps of seismic hazard zones are issued by the California Geological Survey (CGS, formerly California Department of Conservation, Division of Mines and Geology (CDMG)) in accordance with the Seismic Hazards Mapping Act enacted in 1990. The intent of the Seismic Hazards Mapping Act is to provide for a statewide seismic hazard mapping and technical advisory program to assist cities and counties in developing compliance requirements to protect the public health and safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure and other seismic hazards caused by earthquakes.

Based on the Official Seismic Hazard Zones Map, released February 7, 2002, for the San Jose West Quadrangle, the proposed development is located within an area identified by the State of

California as subject to the hazard of liquefaction. The site is not located within an area identified by the State of California as subject to the hazard of seismically induced landslides (see Figure 8 – Seismic Hazard Zones Map).

8.3.2. Surface Fault Rupture

Earthquake Fault Zones (known as Special Studies Zones prior to 1994) have been established in accordance with the Alquist-Priolo Special Studies Zones Act enacted in 1972. The Act directs the State Geologist to delineate the regulatory zones that encompass surface traces of active faults that have a potential for future surface fault rupture. The purpose of the Alquist-Priolo Act is to regulate development near active faults in order to mitigate the hazard of surface fault rupture.

Based on our field exploration and literature review there are no known surface traces of any active or potentially active faults that pass directly through or project towards the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site is considered low.

8.4. Liquefaction Potential and Dynamic Settlement Assessment

The site, as previously discussed, is within an area identified by the State of California as subject to the hazard of liquefaction. Liquefaction of soils can be caused by ground shaking during earthquakes and is generally known to occur in saturated or nearly saturated cohesionless soils at depths shallower than about 50 feet. Research and historical data indicate that loose, relatively clean granular soils and low plasticity silts are susceptible to liquefaction whereas the stability of clayey silts, silty clays and clays are not typically adversely affected by ground shaking.

Dynamic settlement can occur in both unsaturated and saturated sands when loose to medium-dense granular soils tend to undergo contractive volumetric changes during ground shaking. The following sections present our assessment of liquefaction potential and dynamic settlement at the site.

8.4.1. Groundwater Level for Liquefaction Analysis

For the liquefaction analysis a groundwater depth of 4 feet was used based on the historic high groundwater as discussed in the Groundwater section of this report.

8.4.2. Liquefaction Seismic Demand

Based on the Structural Engineers Association of California (SEAOC) and the Office of Statewide Health Planning and Development (OSHPD) website application (https://seismicmaps.org/) the seismic demand was evaluated for the site with latitude 37.346191° and longitude -121.937395°. The mapped Geometric Mean Peak Ground Acceleration (PGA_M) for a ground motion corresponding to the Maximum Considered Earthquake (MCE) for a Site Class E was determined to be 0.605g. From the USGS Seismic Hazard Interactive Deaggregation website (https://earthquake.usgs.gov/hazards/interactive/) this ground motion corresponds approximately to a predominant earthquake with a magnitude of M_w 7.5. The largest contributors to the seismic hazard at the site are the Hayward-Rodgers creek fault located about 8.85 miles northeast of the

site, the San Andreas fault located about 10.6 miles southwest from the site, and the Calaveras fault located about 9.81 miles northeast of the site. These ground motion parameters were used in the liquefaction analyses. A summary of the seismic demand parameters is presented in Appendix C.

8.4.3. Evaluation of Liquefaction Potential and Sensitivity Analyses

The analyses were based on SPT blowcounts obtained from the 2 exploratory borings and laboratory test results. The field SPT blowcounts were converted considering the energy ratio correction factor C_E of 1.25 to reflect the hammer calibration record. The borehole diameter factor C_B of 1.0 was used per SP117 based on the internal diameter of the hollow stem auger system used during drilling. The blowcounts recorded for soils driven with the 3-inch O.D. California-type sampler with brass rings were converted to equivalent SPT blowcounts using a reduction factor of 0.7 as recommended by SP117.

The liquefaction potential of cohesionless (sandy) soils was evaluated in general accordance with the procedure published by Boulanger and Idriss and (2014) and in conformance with SP117A. The anticipated dynamic settlement of the saturated soils was evaluated using procedure by Yoshimine et al. (2006) which was further adjusted by a calibration factor of 0.9 as recommended by Cetin (2009).

Seismic sensitivity of fine-grained soils was evaluated based on the following 3 categories:

1. Soils with Plasticity Index < 7 (typically silts) are classified as fine-grained soils susceptible to liquefaction like coarse-grained soils.

2. Soils with Plasticity Index > 18 and a degree of sensitivity $S_t > 6$ are classified as seismically sensitive soils susceptible to significant loss of strength during seismic shaking and require additional evaluation. The sensitivity of the on-site fine-grained soils was evaluated based on the water content, Atterberg limits, and effective vertical stresses using the procedures suggested by Terzaghi, Peck and Mesri (1996).

3. Fine-grained soils falling outside the two categories described above are considered to behave like clays and are not considered susceptible to liquefaction or cyclic softening.

Evaluation of the liquefaction potential of granular soils and fine-grained soils with Plasticity Index less than 7 are presented in Appendix D and are summarized in Table 4 in the next section of the report. Evaluation of the sensitivity of the saturated fine-grained soils (i.e., Category 2) to ascertain the potential for cyclic softening was performed based on the boring logs for materials encountered at depths between 4 and 50 feet. Details on the sensitivity evaluation of fine-grained soils with a Plasticity Index greater than 18 are presented in Appendix D. The calculated sensitivity S_t for these soils was less than 6. Therefore, the fine-grained soils encountered in the borings are not considered to be susceptible to cyclic softening during the design earthquake event.

8.4.4. Dynamic Settlement

Dynamic settlement can occur in both unsaturated and saturated sands when loose to medium-dense granular soils undergo volumetric changes during ground shaking. Dynamic settlement can occur in saturated sands due to liquefaction or in unsaturated sands due to densification of the soil matrix. The anticipated dynamic settlement of the saturated soils at the site was evaluated using SPT data from the current field exploration in accordance with the procedures outlined by Yoshimine et al (2006) and Cetin (2009).

The unsaturated dynamic settlement was calculated based on SPT data according to the procedure outlined by Pradel (1998a and 1998b). Table 4 presents the results of the liquefaction analyses and corresponding settlement evaluation as well as the dynamic settlement of unsaturated soils. Details of dynamic settlement analyses are presented in Appendix D.

As shown in Table 4, the total (combined) dynamic settlement was estimated to be about 1.0 to 1.5 inches. The differential seismic settlement was estimated to be 0.75 inches or less over a horizontal distance of 30 feet. Therefore, structural mitigation of the total and differential seismic settlement is considered acceptable for the project design.

Table 4
Results of Liquefaction and Dynamic Settlement Analyses

Boring No.	Groundwater Depth (feet)	Liquefiable Zone Depth Interval (feet)	FS_{liq}	Approximate Dynamic Settlement (inches)		
				Saturated Soils (liquefaction)	Unsaturated Soils	Combined
Tt-1	4	30-33	0.18	1.0	negligible	1.0
Tt-2		20-23 30-35	0.22 0.68	1.5		1.5

8.5. Lateral Spreading

Due to the level topography and the absence of free face slopes lateral spreading is not considered to be a hazard at the site.

8.6. Landslide Hazard

The site is not located within a State designated hazard zone for earthquake-induced landslides. Due to the level topography the potential for landslides is not considered a hazard for the site.

8.7. Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought,

or other factors which can cause unacceptable settlement or heave that could adversely affect the performance of structures or slabs supported on grade.

Expansion Index (EI) testing of the surficial sandy materials within the upper 5 feet showed an EI value of 4, indicating a very low expansion potential. The Expansion Index testing of fine-grained materials i.e., clays, at a depth of 15 feet showed an EI value of 60, indicating the presence of expansive soils. For the design purposes the on-site fine-grained soils should be considered to be expansive per CBC 2019 §1803.5.3, and appropriate recommendations are provided in the Recommendations section of this report.

8.8. Collapsible Soils

The phenomenon of hydro-consolidation is typically exhibited in geologically young, unconsolidated, low-density, loose, dry soils commonly present in arid to semi-arid regions. Collapsible soils are usually composed of granular particles that are supported by a clay or silt matrix that can be chemically cemented in place creating a porous structure. The bonds supporting this porous structure have enough shear strength to support loads at low moisture contents, however, once water is introduced the cemented bond structure breaks down and the granular particles are re-arranged causing significant volume loss.

Based on the consolidation testing it was observed that none of the samples collapsed upon wetting, therefore hydrocollapse is not considered a hazard at the site.

8.9. Tsunamis and Seiches

A tsunami is a sea wave generated by large-scale displacements of the ocean floor that causes a sudden surge of water onto the land. Tsunamis are most commonly caused by movement along faults and underwater landslides activated by earthquakes. Seiches are earthquake-induced displacements of water within an enclosed body of water such as a lake. Strong ground motions from an earthquake can cause the water to slosh back and forth onto land. The site is elevated at least 74 feet above sea level and is located at a substantial distance from a significant body of water within an enclosed basin. The site is also not located within a Tsunami Inundation Area, based on our review of the California Geological Survey Tsunami Hazard Area Map for the County of Santa Clara, dated July 8, 2021. Therefore, geologic hazards associated with a tsunami or seiches are not anticipated at the site.

8.10. Subsidence

Land subsidence is the lowering of the ground surface due to extraction or lowering of groundwater levels or other fluids (e.g., oil) within the subsurface soil pores. The fluid withdrawal causes the alluvial sediments in the basin to compact. Damage caused by subsidence can be visible soil cracks, fissures, or surface depression. The site is located in an area mapped by the United States Geological Survey (USGS) where either historical or current subsidence has been recorded (https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html). Provided that groundwater management strategies that include subsidence mitigation are being employed in the

area, ground subsidence beneath the site that could result in damage to future site improvements is unlikely to occur at the site.

9. DESIGN RECOMMENDATIONS

9.1. General

Based on the results of the field exploration and engineering analyses, it is Tetra Tech's opinion that the proposed development is feasible from a geotechnical standpoint, provided that the recommendations contained in this report are incorporated into the design plans and implemented during construction. The proposed building may be supported on a conventional mat foundation established on native soils. The primary design considerations identified from a geotechnical standpoint include:

- presence of deep relatively weak and compressible fine-grained soils (i.e., lean clay);
- presence of soft/wet soil conditions that may require special handling during excavation work as well as dry back, if used as compacted fills. Subgrade improvements are also expected where soft/wet soil conditions are exposed;
- potential for the presence of shallow groundwater level during construction that may require dewatering;
- need to design for uplift pressures;
- need for temporary shoring during the subterranean level excavation; and
- presence of expansive soils at the site.

The design recommendations presented below are based on Tetra Tech's current understanding of the project and the subsurface conditions of the site. Once the project configuration is finalized and the design is complete, Tetra Tech should review the plans and specifications to evaluate if the geotechnical design recommendations presented herein have been incorporated as intended. Although not considered likely to be the most efficient foundation system, alternatives to the proposed mat foundation, such as a combination of ground improvements and conventional shallow foundations, or deep foundations, e.g., piles, may be utilized for the support of the building. Specific recommendations for such alternatives are available upon request.

9.2. Site Preparation

The following sections present recommendations to prepare the site before the building foundations are built.

9.2.1. Clearing and Grubbing

Prior to commencement of the earthwork, the surface of areas to be graded should be cleared of any pavement, vegetation, undocumented fills, existing structures, trash and debris. Any subterranean installations not to be preserved, such as electrical lines, pipes, utility collectors,

tanks, etc., should be relocated and/or abandoned in accordance with the recommendation of the Geotechnical Engineer and applicable regulations.

9.2.2. Subgrade Preparation

In order to create uniform and competent bearing conditions for the proposed building mat foundation and other site improvements, removal of undocumented existing fills and other unsuitable materials should be performed in accordance with the recommendations provided below.

- The building mat foundation will involve an excavation of about 12 to 15 feet. The total depth of excavation will need to include the depth of overexcavation required per this section. For planning purposes, it is likely that the foundation subgrade will likely expose wet and soft subgrade soils, and potentially groundwater. Therefore, subgrade stabilization will be required including the possibility of dewatering to facilitate providing a uniform, firm and unyielding subgrade. Although the soils below the mat subgrade are likely to be saturated or nearly saturated, the proposed stabilization will also help mitigate for the presence of expansive soils. A method to stabilize the potentially wet and soft subgrade is presented in Table 5. Any dewatering system, if needed, should keep the groundwater at a depth of at least 3 feet below the bottom of the excavation (including overexcavation depth per Table 5). It is recommended that a section of the footprint be selected on a trial basis to test the effectiveness of the proposed method, before undertaking the stabilization over the whole area.

  If it becomes impractical to use the method recommended in Table 5, soil stabilization could also be provided by using chemical stabilization, i.e., adding cement and/or lime to a depth of at least 2 feet below the mat subgrade.

Table 5
Method for Handling Unstable Materials at the Excavated Subgrade

Step 1	Overexcavate at least 2 feet below the mat foundation bottom
Step 2	Improve the soft subgrade by working in open-graded aggregate material (particle size larger than 1 inch) as much as possible/practical into the subgrade.
Step 3	Place woven geotextile, Mirafi RS580i or approved equivalent, over the exposed surface.
Step 4	Place and compact 1-foot of well-graded fill (e.g., AB, CMB) to specified compaction over the geotextile.
Step 5	Place woven geotextile, Mirafi RS580i or approved equivalent, over the exposed surface.
Step 6	Place and compact 1-foot of well-graded fill (e.g., AB, CMB) to specified compaction over the geotextile.

- New Pavement areas should be overexcavated and recompacted to a depth of at least 2 feet below the proposed pavement subgrade elevation, or to uniform competent soils, whichever is

deeper. To the extent practicable, the zone of overexcavation should extend a horizontal distance of at least 2 feet beyond the outside perimeter of the pavement.

- Flatwork areas including exterior flatwork slabs should be overexcavated and recompacted to a depth of at least 1 foot below the proposed subgrade elevation, or to uniform acceptable soils, whichever is deeper. To the extent practicable, the zone of overexcavation should extend a horizontal distance of at least 1 foot beyond the perimeter of the exterior slabs and other flatwork and 2 feet beyond the outside perimeter of the pavement.

- Entrance Driveway Pavement areas where existing pavement will be replaced to full depth, no overexcavation is required. The exposed subgrade should be scarified to a depth of 6 inches, moisture-conditioned to at least 125 percent of optimum moisture content and compacted to at least 95 percent of relative compaction per ASTM D1557.

- Disturbed soils in structural and non-structural areas will likely occur after demolition of existing site improvements or during overexcavation. The disturbed soils should be overexcavated and recompacted to the total depth of the disturbed material.

9.2.3. Fill Placement

Excavated on-site soils may be re-used as compacted fill, provided they are free of organics, deleterious materials, debris and particles over 3 inches in largest dimension. In addition, site soils at a depth of 10 feet or more will likely be well over the optimum moisture content and will require drying back, if used directly as compacted fill.

Fills should be placed in loose lifts not more than 8 inches in thickness. Fill placement associated with recompaction of overexcavated soils, fill placed to achieve finish grade or subgrade, or utility trench backfill should be moisture-conditioned to at least 125 percent of the optimum moisture content if the soils are fine-grained, or moisture-conditioned wet of optimum moisture content if the soils are coarse-grained, and compacted to at least 90 percent of relative compaction per ASTM D1557.

The upper one foot of soils below pavements and flatwork should be processed and compacted to at least 95 percent of relative compaction per ASTM D1557.

Soil materials (including general fill, structural backfill, or base course materials) imported to the site should be sampled, tested, and approved by the Geotechnical Engineer prior to arrival on-site. In general, any soils imported to the site for use as fill should be predominantly granular with fines content less than 15 percent and have an Expansion Index less than 20. Import materials should be moisture-conditioned to at least wet of the optimum moisture content and compacted to at least 90 percent of relative compaction per ASTM D1557. Additional recommendations for site grading are provided in the General Site Grading Recommendations section of this report.

9.3. Excavation Characteristics, Temporary Slopes and Trench Excavations

The near surface soils are readily excavatable with conventional earth-moving equipment. However, the soils are anticipated to become wet and soft at depths generally over 10 feet. Therefore, special handling with track mounted equipment (i.e., excavator) will likely be required. Depending on groundwater levels at the time construction, dewatering may also be necessary.

All trench excavations should be performed in accordance with CalOSHA regulations. The on-site soils above the groundwater level may be considered a Type B soil, as defined by the current CalOSHA soil classification.

Sides of temporary, unsurcharged excavations less than 15 feet deep should be sloped back at an inclination of 1(H):1(V) or flatter. For Type B soils benching could be used as long as the overall slope is kept at an inclination of 1(H):1(V) or flatter, however the vertical excavation bench height may not exceed 4 feet. Where space for sloped sides is not available, shoring will be necessary. For any configurations where the depth of the excavation exceeds 15 feet, a slope stability analysis should be performed by the Geotechnical Engineer.

Stockpiled (excavated) materials should be placed no closer than half of the excavation depth or 4 feet from the top of the trench, whichever is greater. A greater setback may be necessary when considering surcharge loads such as heavy vehicles, concrete trucks and cranes. Tetra Tech should be advised of such heavy vehicle loadings so that specific setback requirements can be established for the used equipment. Alternatively, a shoring system may be designed to allow reduction in the setback distance.

The Geotechnical Engineer should observe the excavation progress so that appropriate modifications to the excavation design may be recommended, if necessary, due to conditions differing from the design assumptions.

9.4. Temporary Shored Excavations

Excavation depths for the construction of the proposed building are anticipated to be at a depth between 12 and 15 feet. Review of the groundwater depth from the existing monitoring wells at the site is required before construction in order to determine whether or not a dewatering system is needed. The permits for a dewatering system, if needed, will require disposing of the extracted water in accordance with local regulations.

Cantilevered shoring systems are typically suitable and practicable for retained heights less than about 15 feet. Alternatively, restrained shoring system with internal bracing may be considered. Presented herein are design recommendations for both shoring systems. The shoring designer will need to take into account the presence of adjacent structures, utilities, conduits, and other underground structures and their impact on the installation and performance of the shoring system.

All components of the shoring system, including the penetration depth, should be designed by a specialist Civil Engineer registered in the State of California and should further satisfy

requirements of Cal-OSHA. It is recommended that the final shoring design be reviewed by the Geotechnical Engineer.

9.4.1. Temporary Dewatering

Recommendations are provided herein for excavations up to a depth of 15 feet which is expected to facilitate construction of the foundation subgrade. Since the groundwater depth at the site is anticipated to vary significantly throughout the year as discussed in the "Groundwater" section of this report, the actual depth of groundwater should be determined prior to construction based on groundwater depth measurements at the existing monitoring wells at the site. Since the dewatering is an important design and construction consideration, groundwater depth readings from the onsite monitoring wells should be taken prior to finalizing the design documents and completing the bidding process to conclusively establish the need for dewatering. Dewatering system should be designed to lower the groundwater to a depth of at least 3 feet below the bottom of the excavation (including any overexcavation depth) throughout the footprint of the excavation. Given the fine-grained nature of the soils, and the recommended subgrade stabilization method, if sheet piles are used, the dewatering, if needed, may likely be performed from within the excavation.

9.4.2. Shoring Design

Either sheet pile or soldier pile and lagging systems may be utilized for the proposed construction. However, sheet piles may be more efficient if dewatering is required. Table 6 below summarizes the governing geotechnical design parameters and loading diagrams for a shoring system for both cantilever and internal bracing conditions. These geotechnical parameters were developed based on the following assumptions:

- the shored soil grade is level;
- there are no hydrostatic pressures behind the wall;
- the groundwater remains below the excavation bottom; and
- the shoring is temporary.

If any of these assumed conditions cannot be met due to field conditions or the contractor's method of construction, this office should be consulted regarding potential revisions to our recommendations. It is also noted that to protect structures located at or adjacent to the property line, the shoring designer for this zero-lot condition may consider increasing the recommended cantilevered and restrained lateral pressures by multiplying them by a factor of 1.5 and 1.2 respectively.

Any surcharge (live or dead load) located within a 1(H):1(V) plane drawn up from the excavation bottom should be accounted for in the calculation of the lateral earth pressures. For cantilevered and restrained shoring systems, the lateral contribution of a uniform surcharge load may be calculated by multiplying the surcharge by a factor of 0.35 and 0.46, respectively. The shoring designer for a zero-lot condition may consider increasing the recommended factors for cantilevered and restrained shoring systems by multiplying them by a factor of 1.5 and 1.2 respectively. This constant lateral load, i.e., independent of depth, should be applied throughout the whole exposed height of the sheet pile or soldier pile wall. As a minimum, 3 feet of equivalent

soil surcharge, i.e., 360 psf, is recommended to be included to account for nominal construction surcharge and traffic loads on the adjacent roads. In addition, due to potential partial wetting of soils during construction, it is recommended that an additional swelling pressure be included in the design of the temporary shoring as indicated in Table 6.

Table 6
Geotechnical Design Parameters
Cantilevered and Restrained Temporary Shoring
(without hydrostatic pressure build-up behind the wall)

Excavation bottom depth (including overexcavation depth)	Up to 15 feet	
Subsurface materials	**Alluvial Soils** Mostly firm to stiff lean clays and silts to depth of 30 feet Groundwater depth during construction assumed at a depth of 3 feet below the bottom of the excavation	
SHORING SYSTEM	**Cantilevered shoring** (excavation depth less than about 12 to 15 feet)	**Restrained shoring** with internal bracing
Soil unit weight, γ	125 pcf	
Design friction angle, ϕ	29°	0°
Design cohesion, c	0 psf	1,000 psf
K_a … coefficient of active lateral pressure	0.35	n/a
Stability number, Ns = $\frac{\gamma \cdot H}{C}$	n/a	1.6-1.8
LOADING DIAGRAM ON SHORING		
Equivalent fluid density, EFD	43 pcf	n/a
Loading Diagram	Triangular distribution	Trapezoidal load distribution based on stability numbers (see Diagram 1 below)
Additional Lateral Pressure due to Potential Swelling	15 psf (constant with depth)	
ALLOWABLE PASSIVE PRESSURE BELOW EXCAVATION BOTTOM		
Design friction angle, ϕ	29°	
K_p … coefficient of passive lateral pressure	2.88	
Arching capability *	2.0 (for design of soldier pile systems)	
Equivalent fluid density (pcf EFD) ** (triangular distribution) – includes Safety Factor of 1.5 – ignore resistance within upper 12 inches	Sheet pile system: 240 / 120 (above / below groundwater) Soldier pile system (includes arching): 480 / 240 (above/below groundwater)	

* Per Caltrans Trenching and Shoring Manual (2011)
** Valid without reduction for soldier pile spacing > 2.0 times the effective pile width

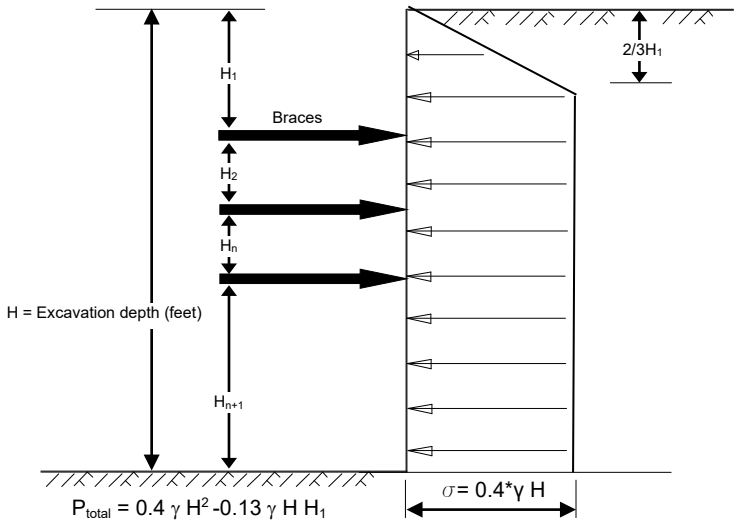


Diagram 1. Lateral pressures loading for a restrained shoring with N_s = <4

The required penetration depth of the soldier or sheet pile wall below the excavation bottom may be calculated based on the estimated passive soil resistances provided in Table 6. Passive soil resistance should be ignored for the upper 12 inches below the excavation bottom to account for potential near-surface soil disturbance.

9.4.3. Deflection

It should be realized that some shroing deflection will likely occur. However, it is difficult to accurately predict the amount of deflection of a shored excavation because it depends not only on the shoring system design but also significantly on the quality of construction. The shoring system should be designed so that deflection at the top of the shored excavation is kept below 1 inch. If greater deflection occurs during construction, additional bracing or restraint may be necessary to minimize settlement of the nearby improvements. If it is desired to reduce the deflection of the shoring, a greater lateral earth pressure could be used for the shoring design.

9.4.4. Internal Bracing

Internal bracing can be provided with struts or rakers designed for lateral earth pressures provided in Table 6 and shown schematically in Diagram 1 for the restrained shoring system.

If used, raker bracing could be supported on temporary concrete footings. For design of temporary footings poured with the bearing surface normal to the rakers inclined at 45 to 60 degrees from the vertical, an allowable bearing capacity value of 1,700 psf may be used, provided the shallowest point of the footing is at least 1 foot below the lowest adjacent grade. To reduce the movement of the shoring wall, the rakers should be tightly wedged against the footings and shoring wall.