Appendix B

Air Quality Assessment

681 E. TRIMBLE ROAD & SEELY AVENUE MIXED-USE DEVELOPMENT AIR QUALITY ASSESSMENT

San José, California

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Introduction

The purpose of this report is to address air quality and health risk impacts associated with the proposed 681 E. Trimble Road and Seely Avenue Mixed-Use Development project located in San José, California. The air quality impacts from this project would be associated with the demolition of the existing land uses, construction of the new buildings and infrastructure, and operation of the project. Air pollutants associated with construction and operation of the project were predicted using appropriate computer models. In addition, the potential project health risk impacts (construction and operation) and the impacts of 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 existing 22.2-acre project site includes mostly vacant land and is only occupied by two residences, a fruit stand, and agricultural land. The project proposes to demolish the existing land uses to construct 1,470 residential units, 56,500 square-feet (sf) of retail space, a 2.5-acre public park, associate development roadways, and a 0.1-acre domestic water well site for San Jose Municipal Water. The development would include a mix of 154 three-story townhomes, three seven- to eight-story market-rate mixed-use buildings (Buildings 1-3) with 380 residential units and 5,431-sf of retail in Building 1, 386 residential units and 44,415-sf of retail in Building 2, and 378 residential units and 6,653-sf of retail in Building 3, and a six-story, 172-unit affordable housing building. At- or above-grade parking would be provided in Buildings 1-3 and the affordable housing building and attached two-car garage would be provided for the townhomes, for a total of 2,120 parking spaces.

Updates to Project

Several changes to the proposed Project have occurred since the original air quality analysis was completed. These changes included a slight increase in residential units, a substantial decrease in retail square footage, Buildings 1, 2, and 3 would now be constructed in the order Buildings 2, 1, and 3, and the new on-site water well would require a 500-kilowatt diesel-powered generator for emergency operations.

The land use changes and construction building phasing would not change construction assumptions such that emissions would be greater. Compared to the original plan that was analyzed for construction impacts, the total land use square-footage would overall decrease and the planned construction activities would occur in different years. However, the total construction equipment quantities and usage would be the same, such that impacts and potential mitigation would remain the same. Therefore, the construction analyses in this study were not updated.

The operational modeling which utilized CalEEMod and EMFAC2021 was updated. The land use changes resulted in changes to traffic. In addition, the emergency generator for the water well would increase emissions based on testing and potential emergency operation.

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

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 ($PM_{2.5}$).

<u>Air Pollutants of Concern</u>

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.

<u>Toxic Air Contaminants</u>

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants. 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. The most recent Office of Environmental Health Hazard Assessment (OEHHA) risk assessment guidelines were published in February of 2015.[2] See *Attachment 1* for a detailed

[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.

description of the health 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, elementary schools, and parks. 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 multi-family residences to the northwest of the project site. There are more sensitive receptors located at farther distances to the northwest. The 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, 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_{10} and $PM_{2.5}$) 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.

[3] USEPA, 2000. *Regulatory Announcement, Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. EPA420-F-00-057. December.

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 of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the federal on-road and non-road diesel engine emission standards for new engines, as well as adoption of regulations for low sulfur fuel in California.

CARB has adopted and implemented a number of 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 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, this measure 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.

[4] California Air Resources Board, 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. October.

BAAQMD is the lead agency in developing plans to address attainment and maintenance of the National Ambient Air Quality Standards and California Ambient Air Quality Standards. 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. Overburdened communities are areas located (i) within a census tract identified by the California Communities Environmental Health Screening Tool (CalEnviroScreen), Version 4.0 implemented by OEHHA,[6] as having an overall CalEnviroScreen score at or above the 70th percentile, or (ii) within 1,000 feet of any such census tract.[7] 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 located in the San José CARE area but not within a BAAQMD overburdened area as identified by CalEnviroScreen as the Project site is scored at the 39th percentile.

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 CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They also include assessment methodologies for air toxics, odors, and greenhouse gas emissions. *Attachment 1* includes detailed health risk modeling methodology.

San José Envision 2040 General Plan

The San José Envision 2040 General Plan includes goals, policies, and actions to reduce exposure of the City's sensitive population to exposure of air pollution and toxic air contaminants or TACs. The following goals, policies, and actions are applicable to the proposed project and this assessment:

[5] See BAAQMD: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program , accessed 2/18/2021.
[6] OEHHA, CalEnviroScreen 4.0, 2021. Web: https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40
[7] 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.
[8] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

Applicable Goals – Air Pollutant Emission Reduction

Goal MS-10 Minimize emissions from new development.

Applicable Policies – Air Pollutant Emission Reduction

MS-10.1 Assess projected air emissions from new development in conformance with the Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines and relative to state and federal standards. Identify and implement feasible air emission reduction measures.

MS-10.2 Consider the cumulative air quality impacts from proposed developments for proposed land use designation changes and new development, consistent with the region's Clean Air Plan and State law.

MS-10.3 Promote the expansion and improvement of public transportation services and facilities, where appropriate, to both encourage energy conservation and reduce air pollution.

MS-10.5 In order to reduce vehicle miles traveled and traffic congestion, require new development within 2,000 feet of an existing or planned transit station to encourage the use of public transit and minimize the dependence on the automobile through the application of site design guidelines and transit incentives.

MS-10.7 Encourage regional and statewide air pollutant emission reduction through energy conservation to improve air quality.

MS-10.11 Enforce the City's wood-burning appliance ordinance to limit air pollutant emissions from residential and commercial buildings.

MS-10.13 As a part of City of San José Sustainable City efforts, educate the public about air polluting household consumer products and activities that generate air pollution. Increase public awareness about the alternative products and activities that reduce air pollutant emissions.

Applicable Goals – Toxic Air Contaminants

Goal MS-11 Minimize exposure of people to air pollution and toxic air contaminants such as ozone, carbon monoxide, lead, and particulate matter.

Applicable Policies – Toxic Air Contaminants

MS-11.2 For projects that emit toxic air contaminants, require project proponents to prepare health risk assessments in accordance with BAAQMD-recommended procedures as part of environmental review and employ effective mitigation to reduce possible health risks to a less than significant level. Alternatively, require new projects (such as, but not limited to, industrial, manufacturing, and processing facilities) that are sources of TACs to be located an adequate distance from residential areas and other sensitive receptors.

MS-11.4 Encourage the installation of appropriate air filtration at existing schools, residences, and other sensitive receptor uses adversely affected by pollution sources.

MS-11.5 Encourage the use of pollution absorbing trees and vegetation in buffer areas between substantial sources of TACs and sensitive land uses.

Actions – Toxic Air Contaminants

MS-11.6 Develop and adopt a comprehensive Community Risk Reduction Plan that includes: baseline inventory of toxic air contaminants (TACs) and particulate matter smaller than 2.5 microns (PM2.5), emissions from all sources, emissions reduction targets, and enforceable emission reduction strategies and performance measures. The Community Risk Reduction Plan will include enforcement and monitoring tools to ensure regular review of progress toward the emission reduction targets, progress reporting to the public and responsible agencies, and periodic updates of the plan, as appropriate

MS-11.7 Consult with BAAQMD to identify stationary and mobile TAC sources and determine the need for and requirements of a health risk assessment for proposed developments.

MS-11.8 For new projects that generate truck traffic, require signage which reminds drivers that the State truck idling law limits truck idling to five minutes.

Applicable Goals – Construction Air Emissions

Goal MS-13 Minimize air pollutant emissions during demolition and construction activities

Applicable Policies – Construction Air Emissions

MS-13.1 Include dust, particulate matter, and construction equipment exhaust control measures as conditions of approval for subdivision maps, site development and planned development permits, grading permits, and demolition permits. At minimum, conditions shall conform to construction mitigation measures recommended in the current BAAQMD CEQA Guidelines for the relevant project size and type.

Applicable Actions – Construction Air Emissions

MS-13.4 Adopt and periodically update dust, particulate, and exhaust control standard measures for demolition and grading activities to include on project plans as conditions of approval based upon construction mitigation measures in the BAAQMD CEQA Guidelines.

<u>Significance Thresholds</u>

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 the threshold are considered potentially significant.

Table 1. BAAQMD CEQA Significance Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
Local CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust (PM_{10}/$PM_{2.5}$)	Construction Dust Ordinance or other Best Management Practices	None	
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	

Notes: (1.) ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (μm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5μm or less. (2.) Zone of influence is 1,000 feet from facility boundaries of new sources or from new sensitive receptors.

Source: Bay Area Air Quality Management District, 2017

AIR QUALITY IMPACTS AND MITIGATION MEASURES

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

BAAQMD is the regional agency responsible for overseeing compliance with State and Federal laws, regulations, and programs within the San Francisco Bay Area Air Basin (SFBAAB). BAAQMD, with assistance from the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC), prepares and implements specific plans to meet the applicable laws, regulations, and programs. The most recent and comprehensive of which is the *Bay Area 2017 Clean Air Plan*.[9] The primary goals of the Clean Air Plan are to attain air quality standards, reduce population exposure and protect public health, and reduce GHG emissions and protect the climate. The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality and GHG impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which, in turn, affects region-wide emissions of air pollutants and GHGs.

The 2017 Clean Air Plan, adopted by BAAQMD in April 2017, includes control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. Plans must show consistency with the control measures listed within the Clean Air Plan. At the project-level, there are no consistency measures or thresholds. The proposed project would not conflict with the latest Clean Air planning efforts since 1) the project would be considered urban infill, 2) the project would be located near employment centers, 3) the project would be located near transit with regional connections.

Impact AIR-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?

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

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

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

emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[10] 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 Inputs

Land Use Inputs

The proposed project would be constructed in six phases. Separate CalEEMod runs were conducted for each phase as each phase would construct new buildings and roadways over several years. The land uses for each construction phase were entered into CalEEMod as described in Table 2.

Table 2. Construction Land Uses Entered into CalEEMod

Project Land Uses	Size	Units	Square Feet	Acreage
Infrastructure (2024)				
Apartments Mid Rise	1,316	Dwelling Unit	1,998,854	22.2
Condo/Townhouse	154	Dwelling Unit	371,535	
Regional Shopping Center	56.50	1,000-sf	56,500	
City Park	2.50	Acres	108,900	
Building 1 (2024 – 2025)				
Apartments Mid Rise	380	Dwelling Unit	405,463	2.12
Regional Shopping Center	5.43	1,000-sf	5,431	
Enclosed Parking with Elevator	559	Parking Spaces	177,758	
Townhomes (2024 – 2027)				
Condo/Townhouse	154	Dwelling Unit	301,313	7.28
Enclosed Parking Structure	348	Parking Spaces	70,222	
Affordable Housing (2024 – 2025)				
Apartments Mid Rise	172	Dwelling Unit	136,000	1.24
Enclosed Parking with Elevator	86	Parking Spaces	33,405	
Building 2 (2024 – 2026)				
Apartments Mid Rise	386	Dwelling Unit	407,119	2.12
Regional Shopping Center	44.42	1,000-sf	44,415	
Enclosed Parking with Elevator	595	Parking Spaces	231,520	
Building 3 (2026 – 2027)				
Apartments Mid Rise	378	Dwelling Unit	414,015	2.12
Regional Shopping Center	6.65	1,000-sf	6,653	
Enclosed Parking with Elevator	532	Parking Spaces	193,575	

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.

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

The CalEEMod 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 provided. 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 February 2024 and would be built out over a period of approximately 4 years, or 1,251 construction workdays. The earliest year of full operation was assumed to be 2028.

Construction 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 estimate of demolition material to be exported, soil material imported and/or exported to the site, and the estimate of cement 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 were estimated from the provided demolition and grading volumes by assuming each truck could carry 10 tons per load. The number of concrete and asphalt total round haul trips were provided 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. 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 defaults, where worker trips are assumed to be comprised of light-duty autos (EMFAC category LDA) and light duty trucks (EMFAC category LDT1 and LDT2). Vendor trips are comprised of delivery and large trucks (EMFAC category MHDT and HHDT) and haul trips, including cement 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 (demolition material export and soil import/export). Since CalEEMod does not address cement or asphalt 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 emission rates from the years 2024-2027 for Santa Clara County were used. 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 (Cement/Asphalt)	CalEEMod default distance with 5-min truck idle time.
Infrastructure (2024)				
Demolition	120	-	106	8,000-sf existing building and 350 tons of pavement demolition. CalEEMod default worker trips.
Site Preparation	2,112	-	3,000	23,000-cy of export volume. 1,000-cy of import volume. CalEEMod default worker trips.
Trenching/Utilities	325	-	-	CalEEMod default worker trips.
Paving	660	-	1,560	6,500-cy asphalt hauling. CalEEMod default worker trips.
Building 1 (2024 – 2025)				
Site Preparation	210	-	-	CalEEMod default worker trips.
Trenching	168	-	-	CalEEMod default worker trips.
Building Construction	98,700	20,022	2,600	1,300 cement truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	11,970	-	-	CalEEMod default worker trips.
Paving	130	-	27	113-cy asphalt hauling. CalEEMod default worker trips.
Townhomes (2024 – 2027)				
Trenching/Utilities	490	-	-	CalEEMod default worker trips.
Paving	728	-	400	50 cement truck and 150 asphalt truck round trips. CalEEMod default worker trips.
Building Foundation	7,700	-	-	CalEEMod default worker trips.
Building Construction	102,200	20,440	600	300 cement truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	10,220	-	-	CalEEMod default worker trips.
Affordable Housing (2024 – 2025)				
Site Preparation	100	-	-	CalEEMod default worker trips.
Trenching	80	-	-	CalEEMod default worker trips.
Building Construction	26,910	4,680	400	200 cement truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	3,668	-	-	CalEEMod default worker trips.
Paving	150	-	-	CalEEMod default worker trips.
Building 2 (2024 – 2026)				
Site Preparation	210	-	-	CalEEMod default worker trips.
Trenching	168	-	-	CalEEMod default worker trips.
Building Construction	134,983	29,842	3,800	1,900 cement truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	16,926	-	-	CalEEMod default worker trips.

Paving	130	-	27	113-cy asphalt hauling. CalEEMod default worker trips.
Building 3 (2026 – 2027)				
Site Preparation	210	-	-	CalEEMod default worker trips.
Trenching	168	-	-	CalEEMod default worker trips.
Building Construction	100,392	20,586	3,400	1,700 cement truck round trips. CalEEMod default worker and vendor trips.
Architectural Coating	12,141	-	-	CalEEMod default worker trips.
Paving	100	-	27	113-cy asphalt hauling. CalEEMod default worker trips.
Notes: [1] Based on 2024-2027 EMFAC2021 light-duty vehicle fleet mix for Santa Clara County. [2] Includes demolition and grading trips estimated by CalEEMod based on amount of material to be removed. Cement and trips estimated based on data provided by the applicant.				

Summary of Computed Construction Period Emissions

Average daily emissions were annualized for each year of construction by dividing the annual construction emissions by the number of active workdays during that year. Table 4 shows the annualized average daily construction emissions of ROG, NO_X, PM_{10} exhaust, and $PM_{2.5}$ exhaust during construction of the project. As indicated in Table 4, predicted annualized project construction emissions would not exceed the BAAQMD significance thresholds during any year of construction.

Table 4. Construction Period Emissions

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Construction Emissions Per Year (Tons)				
2024 (Infrastructure, Building 1, Townhomes, Affordable Housing, and Building 2)	0.39	2.84	0.14	0.10
2025 (Building 1, Townhomes, Affordable Housing, and Building 2)	4.50	3.56	0.20	0.14
2026 (Townhomes, Building 2, and Building 3)	5.54	2.26	0.13	0.09
2027 (Townhomes and Building 3)	3.32	1.14	0.06	0.05
Average Daily Construction Emissions Per Year (pounds/day)				
2024 (275 construction workdays)	2.83	20.65	1.04	0.76
2025 (365 construction workdays)	24.68	19.49	1.07	0.79
2026 (365 construction workdays)	30.37	12.37	0.72	0.50
2027 (246 construction workdays)	26.93	9.24	0.52	0.39
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The BAAQMD CEQA Air Quality Guidelines consider these impacts to be less than significant if best management practices are implemented to reduce these emissions and the project is less than screening criteria. *Mitigation Measure AQ-1 would implement BAAQMD-recommended standard best management practices*.

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.

Operational Period Emissions

Operational air emissions from the project would be generated primarily from autos driven by future residents, employees, customers, and vendors. Evaporative emissions from architectural coatings and maintenance products (classified as consumer products) are typical emissions from these types of uses. CalEEMod was used to estimate emissions from operation of the proposed project assuming full build-out.

<u>CalEEMod Inputs</u>

Land Uses

All project land uses from the updated project were combined and input to CalEEMod for the operational period modeling in the year 2028. Inputs are summarized in Table 5. The model output and information supporting any changes to the model are contained in *Attachment 2*.

Table 5. Operational Land Uses Entered into CalEEMod

Project Land Uses	Size	Units	Square Feet	Acreage
Apartments Mid Rise	1,321	Dwelling Units	1,368,958	22.2
Condo/Townhouse	154	Dwelling Unit	301,313	
Regional Shopping Center	20.20	1,000-sf	20,197	
City Park	2.50	Acres	108,900	
Enclosed Parking with Elevator	1,772	Parking Spaces	576,518	
Enclosed Parking Structure	348	Parking Spaces	70,222	

Model 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 CalEEMod. The earliest full year of operation would be 2028 if construction begins in 2024. Emissions associated with build-out later than 2028 would be lower.

Traffic Information

CalEEMod allows the user to enter specific vehicle trip generation rates. Therefore, the project-specific daily trip generation rate provided by the traffic consultant was entered into the model.[11] The proposed project would produce 5,664 new daily trips after a *Residential & Retail Internal Capture Reduction, Location-Based Vehicle Mode Share Reduction, Project-Specific Trip Reduction (i.e., includes effects of Project TDM measures)*, and *Retail Pass-By External Trip Reduction.* The daily trip generation was calculated using the size of the project and the adjusted total vehicle trips. The Saturday and Sunday trip rates were adjusted by multiplying the ratio of the CalEEMod default rates for Saturday and Sunday trips to the default weekday rate with the project-specific daily weekday trip rate. The default trip lengths and trip types specified by

[11] Hexagon Transportation Consultants, Inc., *Seely Avenue Residential Mixed-Use Project (Preferred Alternative)*, April 28, 2023.

CalEEMod were used.

EMFAC2021 Adjustment

The vehicle emission factors and fleet mix used in CalEEMod are based on EMFAC2017, which is an older CARB emission inventory for on road and off-road mobile sources. Since the release of CalEEMod Version 2020.4.0, new emission factors have been produced by CARB. EMFAC2021 became available for use in January 2021. It includes the latest data on California's car and truck fleets and travel activity. The CalEEMod vehicle emission factors and fleet mix were updated with the emission rates and fleet mix from EMFAC2021, which were adjusted with the CARB EMFAC off-model adjustment factors. On road emission rates from 2028 Santa Clara County were used (See *Attachment 3*). More details about the updates in emissions calculation methodologies and data are available in the EMFAC2021 Technical Support Document.[12]

Electric Vehicle Population

Adjustments to mobile emissions for ROG and NOx were made based on the recently adopted Advanced Clean Car II regulation (ACC II) that was adopted in November 2022.[13] This new regulation will increase the number of light-duty automobile and truck EVs on the road by setting zero-emission vehicle (ZEV) sales standards in California. ACC II will reduce emissions from light-duty vehicles starting in the year 2026. ZEV vehicles will make up a greater proportion of the vehicle fleet than currently reflected in the EMFAC2021 model. EV light duty auto and truck sales will make up 35 percent of sales in 2026, 43 percent in 2027 and 51 percent in 2028 when the project becomes operational. The light-duty vehicle portion of the fleet mix in Santa Clara County with ACC II was calculated and compared to the default assumptions in EMFAC2021. The mobile portion of the project emissions were reduced by 4% reduction for ROG emissions and a 2% reduction for NOx emissions.

Energy

CalEEMod defaults for energy use were used, which include the 2019 Title 24 Building Standards. GHG emissions modeling includes those indirect emissions from electricity consumption. The electricity produced emission rate was modified in CalEEMod. An emission factor of 178 pounds of CO_2 per megawatt of electricity produced was entered into CalEEMod, which is based on San Jose Clean Energy's 2020 emissions rate.[14] It should be noted that per Climate Smart San Jose and San Jose's Greenhouse Gas Reduction Strategy, SJCE's goal is provision of 100-percent carbon-free electricity prior to 2030.[15]

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[12] See CARB 2021: https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-modeling-tools-emfac

[13] Advanced Clean Cars II, web: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii

[14] San Jose Clean Energy Website, Standard Greensource service. Web: https://sanjosecleanenergy.org/commercial-rates/

[15] City of San José, 2020. "2030 Greenhouse Gas Reduction Strategy", August. Web: https://www.sanjoseca.gov/home/showpublisheddocument/63667/637347412207870000

The City of San José passed an ordinance in December 2020 that prohibits the use of natural gas infrastructure in new residential, office, and most retail-type buildings.[16] This ordinance applies to any new construction starting August 1, 2021. Natural gas use for the residential land use was set to zero and assigned to electricity use in CalEEMod. Natural gas use was assumed for the retail use as a restaurant could occupy the space. Restaurants are allowed to use natural gas under the City's ordinance.

Wood-Burning Devices

CalEEMod default inputs assume new residential construction would include woodburning fireplaces and stoves. The project would not include wood-burning devices, as these devices are prohibited by BAAQMD Regulation 6, Rule 3.[17] Therefore, the number of woodstoves and woodburning fireplaces in CalEEMod were set to zero.

Consumer Products

The project's area sources for operational ROG emissions would include consumer products. These products include cleaning supplies, kitchen aerosols, cosmetics, toiletries, and other solvents. The default CalEEMod emission factor for these consumer products was updated to reflect more recent Santa Clara County conditions. Updated ROG emission rates were computed using the CalEEMod methodology that utilized 2020 county wide consumer product category emissions and total building square footages. The CARB 2030 emission inventory for consumer products under solvent evaporation (Consumer Products) were divided by total building square footage. The total building square footage, representative of year 2022, was obtained from the FEMA HAZUS-MH software. Adjustments of square footage for Project opening year conditions were adjusted using the change in populations obtained from the California Department of Finance. The updated consumer products ROG emission factor was computed to be 1.84 E^{-05} pounds per square foot per day and used for this analysis.

Project Generator

The project would include one emergency generator as part of a groundwater well located on Lot 3 in the southeast corner of the project site. The generator size has not been determined at this time. It is assumed to be smaller than 500 kilowatts (kW), since that was the size of a generator for a well approved for the Trimble and Agnews Municipal Groundwater Wells Project. The Agnews generator would support three wells, where this project's generator would support one well. Therefore, the Project was assumed to include a 500-kW standby emergency generator powered by a 670 horsepower (HP) diesel engine. The generator would be tested periodically and power the well in the event of a power failure. For modeling purposes, it was assumed that the generator would be operated for testing and maintenance purposes as well as non-testing purposes per BAAQMD's newest Guidelines. CARB and BAAQMD requirements limit these engine operations to 50 hours each per year for testing and maintenance, and new BAAQMD Guidelines

[16] City of San José, 2020. "Expand Natural Gas Ban", December. Web: https://www.sanjoseca.gov/Home/Components/News/News/2210/4699

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

recommend including 100 hours each year for non-testing and non-maintenance operations. During testing periods, the engine would typically be run for less than one hour. The engine would be required to meet CARB and EPA emission standards and consume commercially available California low-sulfur diesel fuel. Additionally, the generator would have to meet BAAQMD BACT requirements for IC Engine-Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump sources. The emissions from the operation of the generator were calculated using the CalEEMod model.

Other Inputs

Default model assumptions for emissions associated with solid waste generation and water/wastewater use were applied to the project. Water/wastewater use was changed to 100% aerobic conditions to represent wastewater treatment plant conditions. The project site would not send wastewater to septic tanks or facultative lagoons.

Existing Uses

The site currently consists of two existing residences, a fruit stand, and agricultural land. These uses produce low operational and traffic emissions which would not considerably offset emissions from the proposed project. In addition, no project-specific trip generation rates for the existing land uses were available for this assessment. Therefore, the emissions from the existing uses were not considered.

Summary of Computed Operational Emissions

Annual emissions were computed using CalEEMod and daily emissions were calculated assuming 365 days of operation per year. As shown in Table 6, unmitigated operational emissions would exceed the BAAQMD significance thresholds for ROG during operation of the project. Emissions of other air pollutants would be below the thresholds. However, with mitigation operational ROG emissions would be below the threshold. Details of the emissions modeling are included in *Attachment 2*.

Table 6. Operational Period Emissions

Scenario		**ROG**	**NOx**	**PM_{10}**	**$PM_{2.5}$**
Unmitigated 2028 Annual Operational Emissions (*tons/year*)		**10.00**	2.11	4.25	1.13
Mitigated 2028 Annual Operational Emissions (*tons/year*)		8.98	2.11	4.25	1.13
	BAAQMD Thresholds (tons /year)	*10 tons*	*10 tons*	*15 tons*	*10 tons*
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*	*No*
	Mitigated	*No*	*No*	*No*	*No*
Unmitigated 2028 Daily Operational Emissions –(*lbs/day*)[1]		**54.82**	11.59	23.31	6.21
Mitigated 2028 Daily Operational Emissions – (*lbs/day*)[1]		49.22	11.59	23.31	6.21
	BAAQMD Thresholds (pounds/day)	*54* lbs.	*54* lbs.	*82* lbs.	*54* lbs.
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*	*No*
	Mitigated	*No*	*No*	*No*	*No*
Notes: [1] Assumes 365-day operation.					

Mitigation Measure AQ-2: **Require use of low exterior VOC coatings for to reduce ROG emissions.**

The project shall use low volatile organic compound or VOC (i.e., ROG) coatings, that are below current BAAQMD requirements (i.e., Regulation 8, Rule 3: Architectural Coatings), for at least 90 percent of all residential and nonresidential interior paints and 80 percent of exterior paints. This includes all architectural coatings applied during both construction and reapplications throughout the project's operational lifetime. At least 90 percent and 80 percent of coatings applied for interior and exterior, respectively, must meet a "super-compliant"″ VOC standard of less than 10 grams of VOC per liter of paint. For reapplication of coatings during the project's operational lifetime, the Declaration of Covenants, Conditions, and Restrictions shall contain a stipulation for low VOC coatings to be used. Examples of "super-compliant" coatings are contained in the South Coast Air Quality Management District's website.[18]

Effectiveness of Mitigation AQ-2

During operation, the CalEEMod modeling found the implementation of MM AQ-2 would reduce total ROG emissions by 10 percent. Consumer product and mobile sources would make up a majority of the ROG emissions. Operational ROG emissions would no longer exceed the BAAQMD threshold of 54 pounds per day with mitigation.

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

Project impacts related to increased health risk can occur either by introducing a new source of TACs with the potential to adversely affect existing sensitive receptors in the project vicinity or by significantly exacerbating existing cumulative TAC impacts. The project would introduce new sources of TACs during construction (i.e., on-site construction and truck hauling emissions) and operation (i.e., stationary and mobile sources).

Project construction activity would generate dust and equipment exhaust that would affect nearby sensitive receptors. The project would also include the installation of an emergency generators powered by a diesel engine and would generate some traffic consisting of mostly light-duty vehicles, which would produce TAC and air pollutant emissions.

Project impacts to existing sensitive receptors were addressed for temporary construction activities and long-term operational conditions. There are also several sources of existing TACs and localized air pollutants in the vicinity of the project. The impact of the existing sources of TAC was also assessed in terms of the cumulative risk which includes the project contribution; as well as the risk on the new sensitive receptors introduced by the project.

Health Risk Methodology for Construction and Operation

Health risk impacts were addressed by predicting increased cancer risk, the increase in annual $PM_{2.5}$ concentrations and computing the Hazard Index (HI) for non-cancer health risks. The risk impacts from the project are the combination of risks from construction and operation sources.

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

These sources include on-site construction activity, construction truck hauling, emergency generator operation, and increased traffic from the project. To evaluate the increased cancer risks from the project, a 30-year exposure period was used, per BAAQMD guidance,[19] with the sensitive receptors being exposed to both project construction and operation emissions during this timeframe.

The project increased cancer risk is computed by summing the project construction cancer risk and operation cancer risk contributions. Unlike, the increased maximum cancer risk, the annual $PM_{2.5}$ concentration and HI values are not additive but based on the annual maximum values for the entirety of the project. The project maximally exposed individual (MEI) is identified as the sensitive receptor that is most impacted by the project's construction and operation.

The methodology for computing health risks impacts is contained in *Attachment 1*. This involved the calculation of TAC and $PM_{2.5}$ emissions, dispersion modeling of these emissions, and computations of cancer risk and non-cancer health effects.

Modeled Sensitive Receptors

Receptors for this assessment included locations where sensitive populations would be present for extended periods of time (i.e., chronic exposures). This includes the nearby existing residences to the northwest, as shown in Figure 1. Residential receptors are assumed to include all receptor groups (i.e., third trimester, infants, children, and adults) with almost continuous exposure to project emissions.

Health Risks from Project Construction

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust air pollutant emissions would not be considered to contribute substantially to existing or projected air quality violations. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary health risk impact issue associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. 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 $PM_{2.5}$.[20] This assessment included dispersion modeling to predict the offsite and onsite concentrations resulting from project construction, so that increased cancer risks and non-cancer health effects could be evaluated.

<u>Construction Emissions</u>

The CalEEMod and EMFAC2021 models 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. Total emissions from all construction stages are reported in Table 7 and are on an annual basis. The annual on-road emissions result from haul truck travel during demolition and grading

[19] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.
[20] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.

activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used for vehicle travel while at or near the construction site to represent localized vehicle emissions from construction. The emissions from on-road vehicles traveling at or near the site were modeled to occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were computed by CalEEMod for the overall construction period and are included as part of the total $PM_{2.5}$ emissions reported in Table 7.

Table 7. Annual Unmitigated Construction Emissions of DPM and Fugitive $PM_{2.5}$ (tons)

Contaminant	2024	2025	2026	2027
PM_{10} Exhaust (DPM)	0.0948	0.1289	0.0782	0.0412
$PM_{2.5}$ Fugitive	0.0184	0.0117	0.0096	0.0038

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (residences) 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.[21,22] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

Construction Sources

The AERMOD modeling utilized 12 area sources to represent the on-site construction emissions from the different construction phases (see Figure 1), six areas for exhaust emissions of DPM and six areas for fugitive $PM_{2.5}$ dust emissions. To represent the construction equipment exhaust emissions, an area source emission release height of 20 feet (6 meters) was used for the area sources.[23] 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 do 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. The locations of the area sources used for the modeling are identified in Figure 1.

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

[21] 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
[22] 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
[23] 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

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.

AERMOD Inputs and Meteorological Data

The modeling used a five-year meteorological data set (2013-2017) from the San José Airport prepared for use with the AERMOD model by the BAAQMD. Construction emissions were modeled as occurring during weekdays between 7:00 a.m. to 4:00 p.m. per the project applicant's construction schedule. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2024-2027 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptor locations. Receptor heights of 5 feet (1.5 meters) and 15 feet (4.5 meters) were used to represent the breathing heights on the first and second floors of sensitive receptors in the residences near the site.

Summary of Construction Health Risk Impacts

The maximum increased cancer risks were calculated using the modeled TAC concentrations combined with the OEHHA guidance for age-sensitivity factors and exposure parameters as recommended by BAAQMD, as described in *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 small children to cancer causing TACs. Third trimester, infant, child, and adult exposures were assumed to occur at all residences during the entire construction period.

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

The maximum modeled annual DPM and $PM_{2.5}$ concentrations were identified at nearby sensitive receptors to find the MEI from construction activities. Results of this assessment indicated that the construction MEI for both cancer risk and $PM_{2.5}$ occurred at the same location and was located on the first floor (1.5 meters) of an apartment building on Epic Way northwest of the project sites. The location of the MEI and nearby sensitive receptors are shown in Figure 1. Table 8 lists the health risks from construction at the location of the construction MEI. *Attachment 4* to this report includes the emission calculations used for the construction modeling and the cancer risk calculations.

Health Risks from Project Operation – Stationary Sources and Traffic

Operation of the project would have long-term emissions from mobile sources (i.e., traffic) and stationary sources (i.e., generators). While these emissions would not be as intensive at or near the site as construction activity, they would contribute to long-term effects to sensitive receptors.

Project Traffic

An analysis was conducted of the impacts of TACs and $PM_{2.5}$ from local roadways increase in traffic due to the project. The project would generate 7,761 net daily trips.[24] A majority of these trips would be from light-duty, gasoline vehicles (i.e., passenger cars). To address the added health risks, the impact from this traffic was assessed using the CT-EMFAC 2017 emissions model, AERMOD dispersion model and cancer risk calculations following BAAQMD methodology described in *Attachment 1*. Figure 1 shows the modeled roadway segment.

Traffic Emissions

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ roadway emissions in the project area using the Caltrans version of the EMFAC2017 emission model, known as CT-EMFAC2017.[25] CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and TACs, including DPM. Emission processes modeled include running exhaust for DPM, $PM_{2.5}$ and total organic compounds (e.g., TOG), running evaporative losses for TOG, and tire and brake wear and fugitive road dust for $PM_{2.5}$. All $PM_{2.5}$ emissions from all vehicles were used, rather than just the $PM_{2.5}$ fraction from diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from vehicle tire and brake wear and from re-entrained roadway dust were included in these emissions. DPM emissions are projected to decrease in the future and are 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),[26] traffic mix assigned by CT-EMFAC2017 for the county, year of analysis (2028 – project operational year), and season (annual).

Project operation was assumed to begin in 2028. To calculate the increased cancer risk from increased traffic volumes due to the project traffic, the health risks were adjusted for exposure duration to account for the MEIs being exposed to construction for the four years (2024-2027) of the 30-year period, followed by exposure to roadway traffic for the following 26 years (2028-2053). In order to estimate TAC and $PM_{2.5}$ emissions over the exposure period for calculating increased cancer risks to exiting residents from project traffic, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2028. Year 2028 emissions were conservatively assumed as being representative of future conditions over the time period that

[24] Hexagon Transportation Consultants, Inc., *Seely Avenue Mixed-Use Development Draft Transportation Analysis,* May 3, 2022.
[25] Note that Caltrans has not yet updated their version of EMFAC to incorporate EMFAC2021 emission rates for traffic modeling studies.
[26] 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

cancer risks are evaluated (26 years) from the project site traffic, since overall vehicle emissions, and in particular diesel truck emissions, will decrease in the future.

Traffic Dispersion Modeling Inputs

All project traffic emissions from on- and near-site travel were assumed to be along Seely Avenue. The project's trip generation provided by the traffic consultant of 7,761 net daily trips was used to assess project traffic impacts.[27] The average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[28] which were then applied to the trip volumes to obtain estimated hourly traffic volumes and emissions for the roadways. For all hours of the day, the average speed of 25 mph on the roadway was assumed for all vehicles, 5 mph below the posted speed limit on Seely Avenue.

Dispersion Modeling

Operational traffic roadway travel emissions were modeled with the AERMOD model using a series volume sources along a line (line volume sources) to represent traffic emissions on the roadway segment where all of the project traffic would occur. Five years (2013-2017) of hourly meteorological data from the San José Airport prepared for use with the AERMOD model by the BAAQMD, were used for the modeling. TAC and $PM_{2.5}$ concentrations for 2028 were calculated by the model at the same sensitive receptor locations with the same receptor heights of 5 feet (1.5 meters) and 15 feet (4.5 meters) to represent the breathing heights on the first and second floors of the nearby residences.

Figure 1 shows the project roadway segment modeled and receptor locations used in the modeling. Table 8 lists the project roadway risks and hazards at the locations of the residential cancer risk and $PM_{2.5}$ MEIs. The emission rates and roadway calculations used in the project impact analysis are shown in *Attachment 4*.

Project Emergency Diesel Generator

As previously described, the project would include one emergency generator as part of a groundwater well located on Lot 3 in the southeast corner of the project site. The generator size has not been determined at this time. For modeling purposes, the Project was assumed to include a 500-kW standby emergency generator powered by a 670-HP diesel engine. The location of the modeled generator is shown in Figure 1.

Operation of the diesel generator would be a source of TAC emissions. The generator would be tested periodically and power the system in the event of a power failure. For modeling purposes, it was assumed that the generator would be operated for testing and maintenance purposes. CARB and BAAQMD requirements limit these engine operations to 50 hours each per year for testing and maintenance. During testing periods, the engine would typically be run for less than one hour. The engine would be required to meet CARB and EPA emission standards and consume

[27] Hexagon Transportation Consultants, Inc., *Seely Avenue Mixed-Use Development Draft Transportation Analysis,* May 3, 2022.
[28] 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.

commercially available California low-sulfur diesel fuel. Additionally, the generator would have to meet BAAQMD BACT requirements for IC Engine-Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump sources. The emissions from the operation of the generator were calculated using the CalEEMod model.

The diesel engine would be subject to CARB's Stationary Diesel Airborne Toxics Control Measure (ATCM) and require permits from the BAAQMD, since it will be equipped with an engine larger than 50-HP. BACT requirements would apply to the generator that would limit DPM emissions. As part of the BAAQMD permit requirements for toxics screening analysis, the engine emissions will have to meet Best Available Control Technology for Toxics (BACT) and pass the toxic risk screening level of less than ten in a million. The risk assessment would be prepared by BAAQMD. Depending on results, BAAQMD would set limits for DPM emissions (e.g., more restricted engine operation periods). Sources of air pollutant emissions complying with all applicable BAAQMD regulations generally will not be considered to have a significant air quality health risk impact.

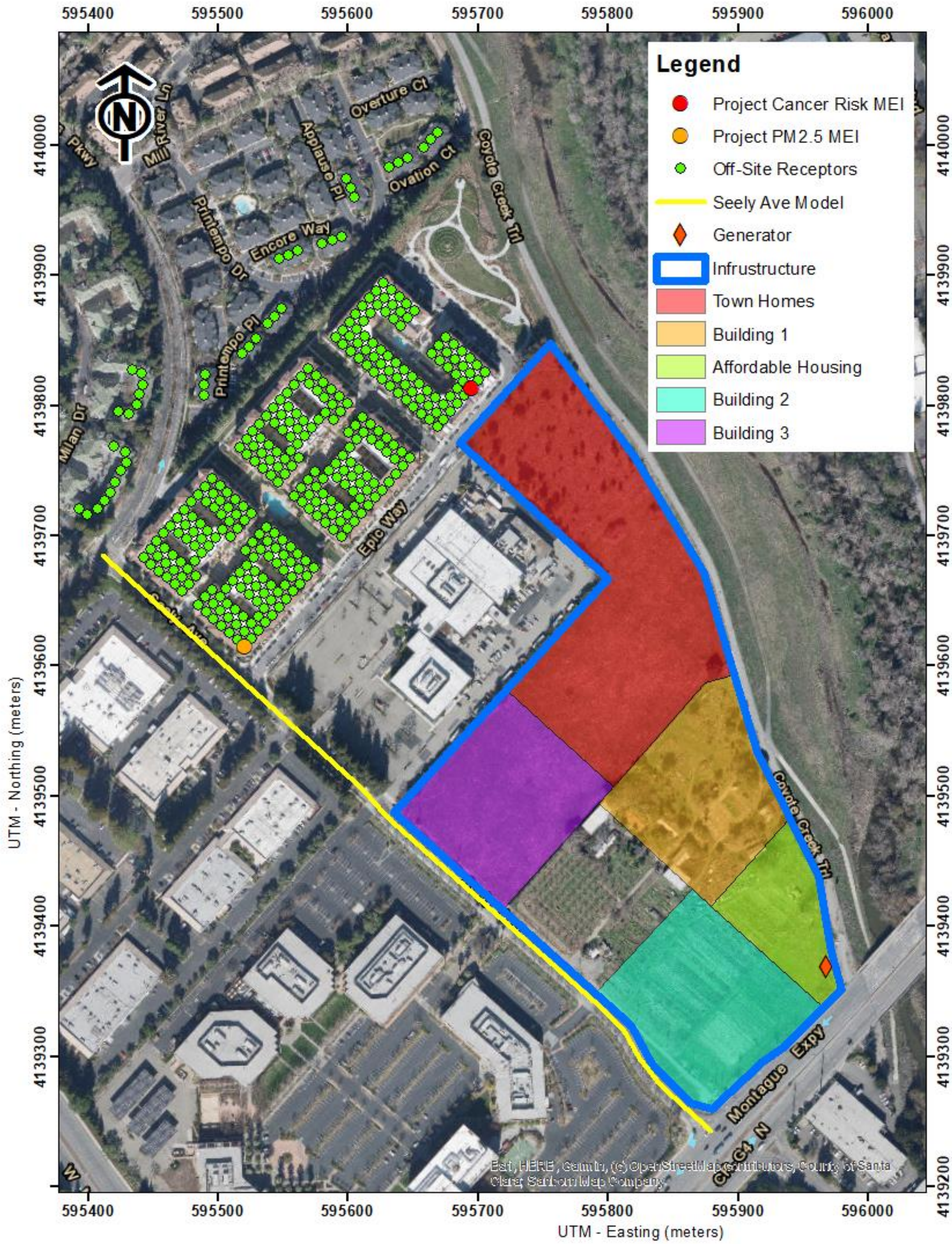
Dispersion Modeling

To estimate potential increased cancer risks and $PM_{2.5}$ impacts from operation of the emergency generator, the same AERMOD dispersion model was used to compute the maximum annual DPM concentration at off-site sensitive receptors (i.e., nearby residences). Emissions of DPM were based on PM_{10} exhaust emissions predicted by CalEEMod for operation of the project generator. The same receptors, breathing heights, and BAAQMD San José Airport meteorological data used in the construction dispersion modeling were used for the generator modeling. Stack parameters (stack height, exhaust flow rate, and exhaust gas temperature) for modeling the generator was based on BAAQMD default parameters for emergency generators.[29] Annual average DPM and $PM_{2.5}$ concentrations were modeled assuming that generator testing could occur at any time of the day (24 hours per day, 365 days per year).

Table 8 shows the generator risks and hazards at the locations of the construction cancer risk and $PM_{2.5}$ MEIs. The emission rates and generator calculations used in the project impact analysis are shown in *Attachment 4*.

[29] BAAQMD, Appendix E of the 2022 *BAAQMD CEQA Guidelines*, April 2023.

Figure 1. Locations of Project Construction Sites, Project Traffic Model, Project Generator, Off-Site Sensitive Receptors, and Maximum TAC Locations (MEIs)



Summary of Project-Related Health Risks at the Off-Site Project MEIs

The total risk impacts from a project are the combination of construction and operation sources. These sources include on-site construction activity and project operations from traffic and the emergency generator. The project cancer risk impact is computed by adding the construction cancer risk for an infant/child to the increased cancer risk for the project operational conditions for the project traffic and generator at the MEI over a 30-year period. The project cancer risk MEI is identified as the sensitive receptor that is most impacted by the project's construction and operation. The project annual $PM_{2.5}$ concentration impact is computed as the total combined $PM_{2.5}$ concentrations from construction and operation. The project $PM_{2.5}$ concentration MEI is identified as the sensitive receptor that is most impacted by the project's construction and operation.

For this project, the sensitive receptors identified in Figure 1 as the cancer risk MEI is the project cancer risk MEI. At this location, the MEI would be exposed to emissions from 4 years of construction and 26 years of project operational (includes project traffic and generator). The project annual $PM_{2.5}$ concentration was located at a different receptor than the construction MEI due to the larger annual $PM_{2.5}$ concentration from project traffic along Seely Avenue. The project $PM_{2.5}$ concentration MEI was location on the first floor (1.5 meters) of another apartment building at the corner of Seely Avenue and Epic Way, northwest of the project sites. The cancer risks from construction and operation of the project were summed together. Unlike, the increased maximum cancer risk, the annual $PM_{2.5}$ concentration and HI impacts are not additive but based on maximum annual values for any year over the entirety of the project.

Project risk impacts are shown in Table 8. The unmitigated maximum cancer risks, annual $PM_{2.5}$ concentration, and HI from construction and operation activities at the residential project MEI locations would not exceed the single-source significance thresholds. However, the project's cancer risk impact is just below to the threshold. With the implementation of *Mitigation Measure AQ-1 and AQ-3*, the project's cancer risk would be lowered to a level well below the single-source threshold. In addition, *Mitigation Measure AQ-1 and AQ-3* would be required to reduce the project's risk impacts to the future on-site project receptors, as discussed further in the report.

Table 8. Construction and Operation Risk Impacts – off-Site Receptors

Source	Cancer Risk** (per million)	Annual $PM_{2.5}$** ($\mu g/m^3$)	Hazard Index
Residential Sensitive Receptor			
Project Construction (Years 0-4)			
Unmitigated	9.58 (infant)	0.04	<0.01
Mitigated*	1.46 (infant)	<0.01	<0.01
Project Traffic, (Years 5-30)	0.03 (child)	0.14	<0.01
Project Generator, (Years 5-30)	0.08 (child)	<0.01	<0.01
Total/Maximum Project Impact (Years 0-30)			
Unmitigated	9.69 (infant)	0.14	<0.01
Mitigated*	1.57 (infant)	0.14	<0.01
BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?			
Unmitigated	*No*	*No*	*No*
Mitigated*	*No*	*No*	*No*

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

** Maximum cancer risk and maximum $PM_{2.5}$ concentration occur at different receptors.

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

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, freeways or highways, busy surface streets, and stationary sources identified by BAAQMD.

A review of the project area based on provided traffic information indicated that traffic on Montague Expressway, River Oaks Parkway, and McCarthy Boulevard would exceed 10,000 vehicles per day. Other nearby streets would have less than 10,000 vehicles per day. A small section of McCarthy Boulevard is just within the influence area, but given that it is on the boundary with the majority of the roadway not within the influence area, McCarthy Boulevard was not included in the cumulative assessment. A review of BAAQMD's stationary source map website identified eight stationary sources with the potential to affect the project MEI. Figure 2 shows the location of the sources affecting the MEI. Health risk impacts from these sources upon the MEI are reported in Table 9. Details of the modeling and health risk calculations are included in *Attachment 5.*

Local Roadways – Montague Expressway and River Oaks Parkway

A refined analysis of potential health impacts from vehicle traffic on Montague Expressway and River Oaks Parkway 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 associated cancer risks are then computed based on the modeled exposures. *Attachment 1* includes a description of how health 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 the roadways using the Caltrans version of the EMFAC2017 emissions model, known as CT-EMFAC2017. CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and TACs, including DPM. Emission processes modeled include running exhaust for DPM, $PM_{2.5}$ and total organic compounds (e.g., TOG), running evaporative losses for TOG, and tire and brake wear and fugitive road dust for $PM_{2.5}$. All $PM_{2.5}$ emissions from all vehicles were used, rather than just the $PM_{2.5}$ fraction from diesel powered vehicles, because all vehicle types (i.e., gasoline and diesel powered) produce $PM_{2.5}$. Additionally, $PM_{2.5}$ emissions from vehicle tire and brake wear and from re-entrained roadway dust were included. DPM emissions are projected to decrease in the future and are reflected in the CT-EMFAC2017 emissions data. Inputs to the model include region (i.e., Santa Clara County), type of road (i.e., major/collector), truck percentage for non-state highways in Santa Clara County (3.51 percent),[30] traffic mix assigned by CT-EMFAC2017 for the county, year of analysis (2024 – construction start year), and season (annual).

[30] 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

In order 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 project MEIs, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2024 (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 2024 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.

The ADT for Montague Expressway and River Oaks Parkway were based on AM and PM peak-hour background traffic volumes for the nearby roadway provided by the project's traffic data.[31] The calculated ADT on Montague Expressway would be 62,500 and on River Oaks Parkway the ADT would be 11,940. Average hourly traffic distributions for Santa Clara County roadways were developed using the EMFAC model,[32] which were then applied to the ADT volumes to obtain estimated hourly traffic volumes and emissions for the roadway. For all hours of the day average speeds of 40 mph on Montague Expressway and 30 mph on River Oaks Parkway were assumed for all vehicles, 5 mph below the posted speed limits of the roadways.

Dispersion Modeling

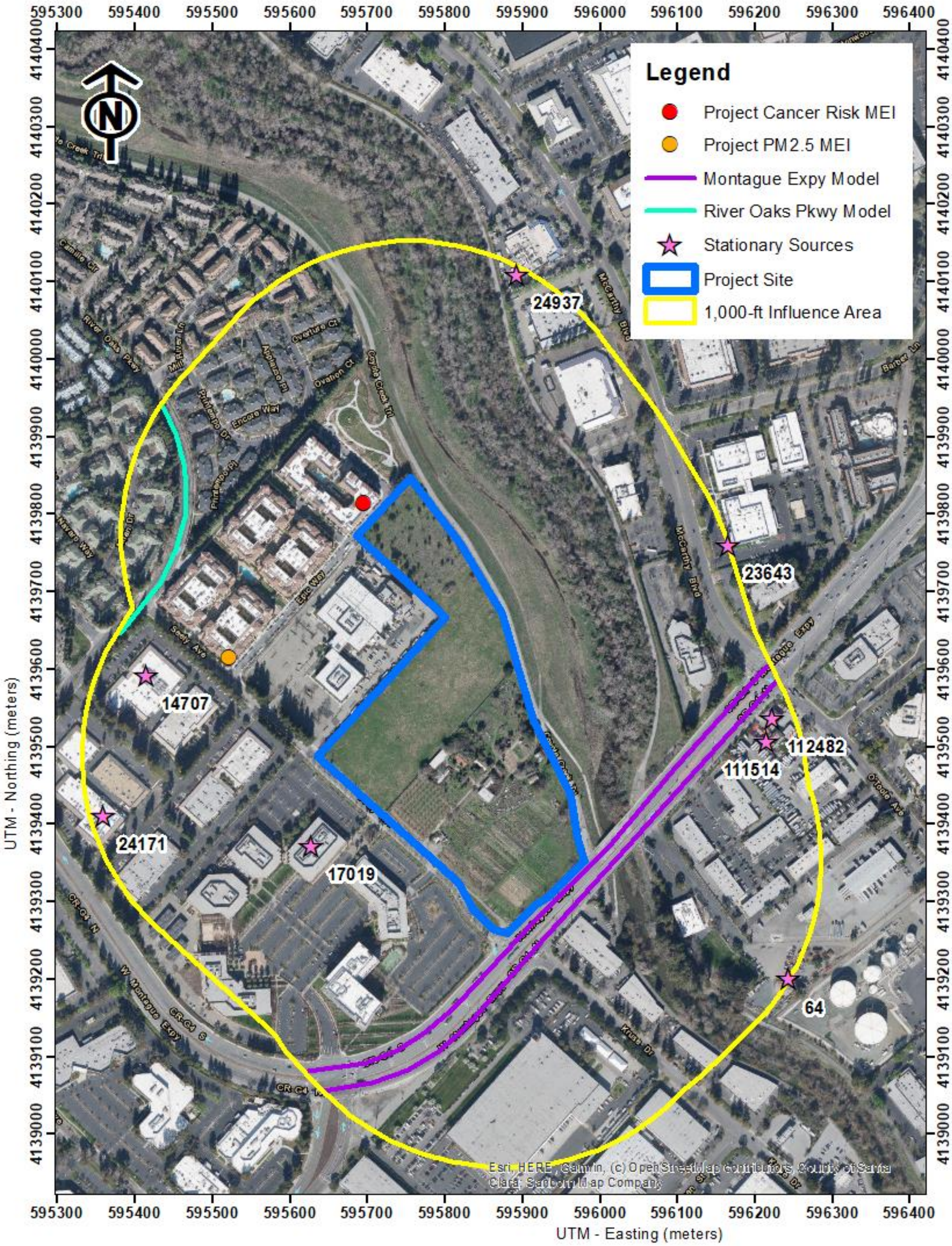
Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the EPA AERMOD air quality dispersion model, which is recommended by the BAAQMD for this type of analysis.[33] TAC and $PM_{2.5}$ emissions from traffic on Montague Expressway and River Oaks Parkway within 1,000 feet of the project site were evaluated. Vehicle traffic on the roadways was modeled using a series of volume sources along a line (line volume sources); with line segments used for opposing travel directions on each roadway. The same meteorological data and off-site sensitive receptor MEI locations from the previous project impact 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 2024 from traffic on the roadways were calculated using the model. Concentrations were calculated at the project MEIs with receptor heights of 5 feet (1.5 meters) to represent the breathing heights at the MEI receptors.

Computed Cancer and Non-Cancer Health Impacts

The cancer risk, $PM_{2.5}$ concentration, and HI impacts from Montague Expressway and River Oaks Parkway on the project MEIs are shown in Table 9. 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 Montague Expressway and River Oaks Parkway traffic are provided in *Attachment 5.*

[31] Hexagon Transportation Consultants, Inc., *Seely Avenue Mixed-Use Development Draft Transportation Analysis,* May 3, 2022.
[32] The Burden output from EMFAC2007, a previous version of CARB's EMFAC model, was used for this since the current web-based version of EMFAC2014 does not include Burden type output with hour by hour traffic volume information.
[33] BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012

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



Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2018* GIS website,[34] which identifies the location of nearby stationary sources and their estimated risk and hazard impacts, including emissions and adjustments to account for new OEHHA guidance. Eight sources were identified using this tool with five sources being diesel generators, two sources being gas dispensing facilities, and one being a petroleum station. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. BAAQMD provided updated emissions data and risk values.[35]

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*, *Gasoline Dispensing Facility*, *and Generic Equipment*. Health risk impacts from the stationary sources upon the MEIs are reported in Table 9.

Summary of Cumulative Risks at the Project MEIs

Table 9 reports both the project and cumulative health risk impacts at the sensitive receptors most affected by project construction and operation (i.e., the project MEIs). The project would not have an exceedance with respect to health risk caused by project construction and operation activities, since the unmitigated maximum cancer risk, annual $PM_{2.5}$ concentration, and HI do not exceed the BAAQMD single-source thresholds. However, the project's cancer risk impact is just below to the threshold. With the implementation of *Mitigation Measure AQ-1 and AQ-3*, the project's cancer risk would be lowered to a level well below the single-source threshold. In addition, *Mitigation Measure AQ-1 and AQ-3* would be required to reduce the project's risk impacts to the future on-site project receptors, as discussed further in the report. The combined cancer risk, annual $PM_{2.5}$ concentration, and HI would not exceed the cumulative thresholds.

[34] BAAQMD, https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65
[35] Correspondence with Matthew Hanson, Environmental Planner II, BAAQMD, December 16, 2021.

Table 9. Cumulative Health Risk Impacts at the Location of the Project MEIs

Source		Cancer Risk* (per million)	Annual $PM_{2.5}$ * ($\mu g/m^3$)	Hazard Index
Project Impacts				
Total/Maximum Project Impacts	Unmitigated Mitigated	9.69 (infant) 1.57 (infant)	0.14 0.14	<0.01 <0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated Mitigated	*No* *No*	*No* *No*	*No* *No*
Cumulative Sources				
Montague Expressway, ADT 62,560		0.46	0.03	<0.01
River Oaks Parkway, ADT 11,940		0.15	0.16	<0.01
Equilon Enterprises LLC-San Jose Terminal (Facility ID #64, Petroleum Station), MEIs at +1,000/+1,000 feet.		1.15	-	0.01
Verizon Business - SQZPCA (Facility ID #14707, Generators), MEIs at +1,000/190 feet.		2.77	0.02	<0.01
Cadence Design Systems, Inc (Facility ID #17019, Generators), MEIs at +1,000/750 feet.		0.90	<0.01	<0.01
Cordis/Cardinal Health (Facility ID #23643, Generators), MEIs at +1,000/+1,000 feet.		0.06	-	-
Eugenus, Inc (Facility ID #24171, Generators), MEIs at +1,000/775 feet.		0.05	<0.01	<0.01
Measurement Specialties, Inc. (Facility ID #24937, Generators), MEIs at +1,000/+1,000 feet.		0.03	<0.01	<0.01
Montague Car Wash (Facility +1,000/+1,000 feet.		0.46	-	<0.01
Propel Fuels Inc. (Facility ID #112482, Gas Dispensing Facility), MEIs at +1,000/+1,000 feet.		0.02	-	<0.01
Combined Sources	Unmitigated Mitigated	15.74 7.62	<0.38 <0.38	<0.10 <0.10
BAAQMD Cumulative Source Threshold		***100***	***0.8***	***10.0***
Exceed Threshold?	Unmitigated Mitigated	*No* *No*	*No* *No*	*No* *No*

* Maximum cancer risk and maximum $PM_{2.5}$ concentration occur at different receptors.

Non-CEQA: On-Site Health Risk Assessment for TAC Sources - New Project Residences

The City's General Plan Policy MS-11.1 requires new residential development projects and projects categorized as sensitive receptors to incorporate effective mitigation into project designs to avoid significant risks to health and safety required when new residential are proposed near existing sources of TACs. BAAQMD's recommended thresholds for health risks and hazards, shown in Table 1, are used to evaluate on-site exposure.

In addition to evaluating health impact from project construction, a health risk assessment was completed to assess the impact that the phased construction emissions from the proposed project and 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.[36] Figure 3 shows the on-site sensitive receptors in relation to the project's phased construction and nearby TAC sources. All on-site health risk results are listed in Table 10. *Attachment 5* includes the dispersion modeling and risk calculations for TAC source impacts upon the proposed on-site sensitive receptors.

Project Phased Construction

Project residents could occupy a building once it has completed construction. Therefore, it was assumed that Building 1 and the Affordable Housing building would have sensitive receptors during the construction of the Town Homes and Buildings 2 and 3, and Building 2 would be occupied while Building 3 is being constructed. The construction analysis for the project residents was conducted in the same manner as described above for the off-site cancer risk and $PM_{2.5}$ MEIs. Receptors were placed within each affected residential area and were spaced every 26 feet (8 meters). Project impacts were modeled at receptor heights used to represent the first and second residential levels of the respective buildings. 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 residential areas for 24 hours per day for 350 days per year. Maximum construction impacts would occur at the first-floor level of Building 1, with the on-site cancer risk and $PM_{2.5}$ MEIs at different receptor locations, as shown in Figure 3. The project construction health risk impacts at the project sites are shown in Table 10. Details of the on-site construction emission calculations, dispersion modeling, and cancer risk calculations are contained in *Attachment 5.*

Project Generator

Project residents would occupy the buildings once construction is completed. The generator supporting the groundwater would be intermittently operational and have localized impacts to the Project. The generator analysis for the project residents was conducted in the same manner as described above for the off-site MEIs. On-site receptors were placed within each affected

[36] 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.

residential area and were spaced every 26 feet (8 meters). Project impacts were modeled at receptor heights used to represent the first through third residential levels of the respective buildings. Maximum increased cancer risks were calculated in the same manner as described above for the on-site MEIs. Generator health risk impacts at the on-site construction MEIs are shown in Table 10. Details of the on-site generator emission calculations, dispersion modeling, and cancer risk calculations are contained in *Attachment 5.*

The maximum generator impacts on the project site occurred at a different location from the maximum on-site construction impact locations. The maximum risk occurred on the third residential level (13.0 meters) at the southern-most receptor in the affordable housing area closest to the generator, as shown in Figure 3. The maximum cancer risk impact from the generator that this location was 15.18 per million, the annual $PM_{2.5}$ concentration was 0.02 µg/m^3, and the HI was less than 0.01. The generator cancer risk impact exceeds the single-source significant threshold.

Impacts associated with the generator operation are based on assumptions that include the largest possible generator. A smaller size generator (in terms of kW or HP) would have lower impacts. For example, a 300-kW generator would result in less-than-significant cancer risks (i.e., cancer risk of 9 per million).

<u>Local Roadways – Montague Expressway and River Oaks Parkway</u>

The roadway analysis for the project residents was conducted in the same manner as described above for the off-site MEIs. Year 2024 emission factors were conservatively assumed as being representative of future conditions during project construction. Roadway ADTs of 62,560 and 11,940 were used for Montague Expressway and River Oaks Parkway, respectively. The portions of Montague Expressway and River Oaks Parkway included in the modeling are shown in Figure 3. Traffic impacts from these roadways were calculated at the on-site construction cancer risk and $PM_{2.5}$ MEIs. The roadway health risk impacts at the project sites are shown in Table 10. Details of the emission calculations, dispersion modeling, and cancer risk calculations are contained In *Attachment 5.*

<u>Stationary Sources</u>

The stationary source screening analysis for the new project sensitive receptors was conducted in the same manner as described above for the project MEIs. Table 10 shows the health risk assessment results from the stationary sources.

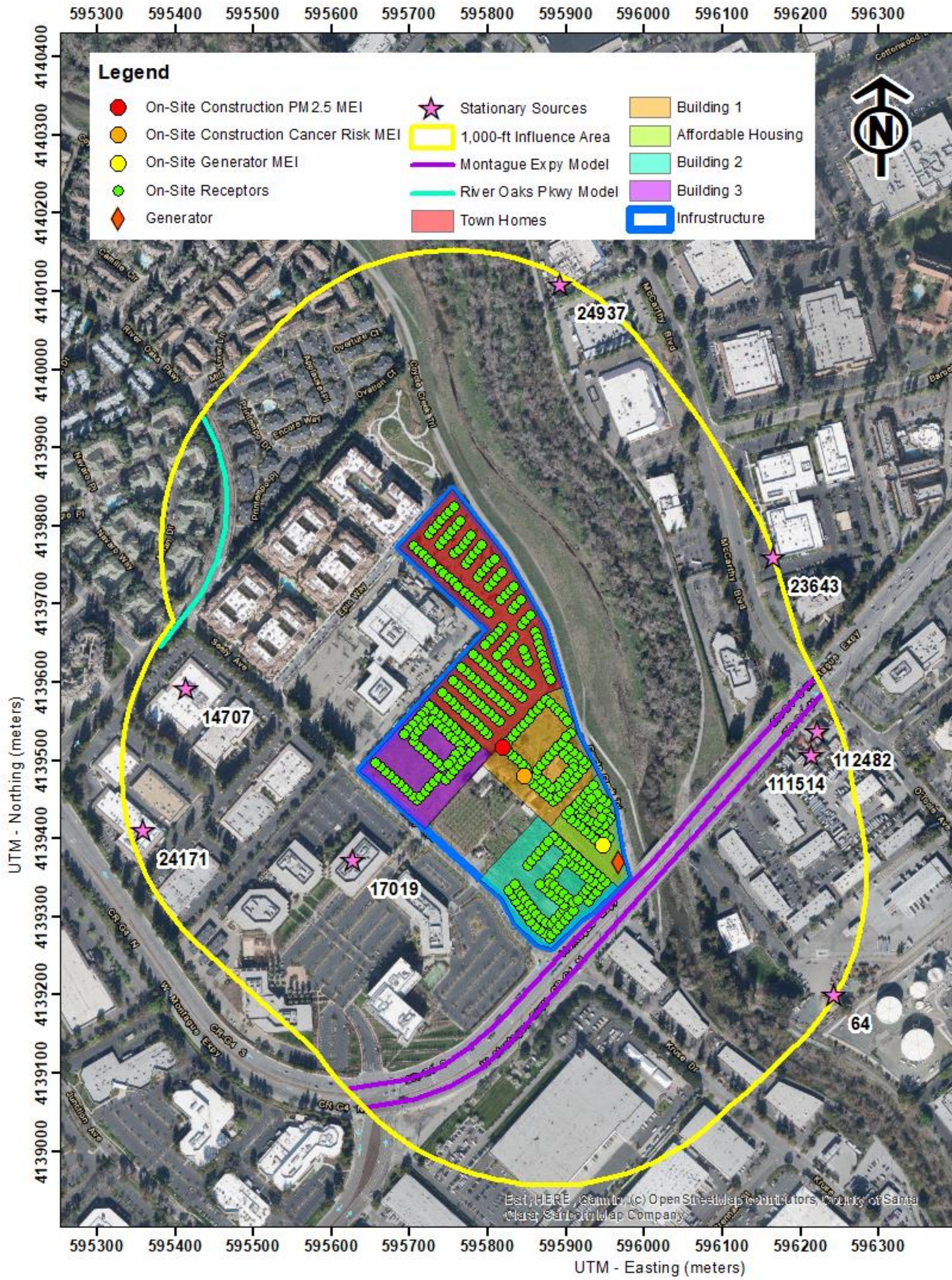
<u>Summary of Cumulative Health Risks at the Project Site</u>

Health risk impacts from both project construction scenarios and existing TAC sources upon the project sites are reported in Table 10. 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, the project construction sources' unmitigated cancer risk impacts exceed the single-source thresholds, but not the cumulative-source thresholds. Implementation of *Mitigation Measures AQ-1 and AQ-3* would reduce cancer risks below the single-source thresholds. The annual $PM_{2.5}$ concentration and HI from the project's unmitigated and mitigated impacts, as well as the impacts from the other nearby sources do not exceed the single-source thresholds. The combined maximum cancer risk, annual $PM_{2.5}$ concentrations, and HI from all sources would not exceed the cumulative thresholds.

Table 10. Cumulative Health Risk Impacts Upon the On-Site Sensitive Receptors

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Sources				
Project Construction Impacts	Unmitigated Mitigated	**21.34** 4.08	0.08 0.03	0.01 <0.01
Project Generator Impacts at On-Site MEI		0.48	<0.01	<0.01
Total/Maximum Project Impact	Unmitigated Mitigated	**21.82** 4.56	0.08 0.03	0.01 <0.01
Cumulative Sources				
Montague Expressway, ADT 62,560		0.65	0.08	<0.01
River Oaks Parkway, ADT 11,940		0.04	0.04	<0.01
Equilon Enterprises LLC-San Jose Terminal (Facility ID #64, Petroleum Station), Project Site at +1,000 feet.		1.15	-	0.01
Verizon Business - SQZPCA (Facility ID #14707, Generators), Project Site at 660 feet.		5.54	<0.01	0.01
Cadence Design Systems, Inc (Facility ID #17019, Generators), Project Site at 200 feet.		9.26	0.01	0.03
Cordis/Cardinal Health (Facility ID #23643, Generators), Project Site at +1,000 feet.		0.06	-	-
Eugenus, Inc (Facility ID #24171, Generators), Project Site at 870 feet.		0.06	<0.01	<0.01
Measurement Specialties, Inc. (Facility ID #24937, Generators), Project Site at 960 feet.		0.03	<0.01	<0.01
Montague Car Wash (Facility ID #111514, Gas Dispensing Facility), Project Site at 820 feet.		0.62	-	<0.01
Propel Fuels Inc. (Facility ID #112482, Gas Dispensing Facility), Project Site at 860 feet.		0.03	-	<0.01
	BAAQMD Single-Source Threshold	***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated Mitigated	***Yes*** *No*	*No* *No*	*No* *No*
Combined Sources	Unmitigated Mitigated	39.26 22.00	<0.24 <0.19	<0.12 <0.12
	BAAQMD Cumulative Source Threshold	***100***	***0.8***	***10.0***
Exceed Threshold?	Unmitigated Mitigated	*No* *No*	*No* *No*	*No* *No*

Figure 3. Locations of Project Site, On-Site Residential Receptors, Project Generator, Roadway Segments Evaluated, Nearby TAC and $PM_{2.5}$ Sources, and Maximum TAC Impacts



Mitigation Measure AQ-3: **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 from construction would be reduced below TAC significance level 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).

    b. Use of electrical or non-diesel fueled equipment.

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 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-3

CalEEMod was used to compute emissions associated with this mitigation measure assuming that all equipment met U.S. EPA Tier 4 Interim engines standards were used along with 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 81 percent to 4.08 chances per million and the total project impact reduced to 4.56 per million, and would no longer exceed the single-source threshold.

Mitigation Measure AQ-4: **Use an emergency generator that has low diesel particulate matter exhaust emissions.**

Modeling of an assumed 500-kW groundwater well stand-by emergency generator showed that the maximum cancer risk impact was above the threshold of 10 per million at the affordable housing units. To avoid this impact, there are two options:

1. Use a generator that is 300 kw or less, or

2. Add controls to the generator such that it meets U.S. EPA Tier 4 standards for particulate matter emissions or is equipped with a CARB certified Level 3 diesel particulate filter that achieves 85% reduction in particulates.

Either of these options would reduce the cancer impact at the affordable housing units to below the single-source significant threshold.

Supporting Documentation

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

Attachment 2 includes the CalEEMod output for project construction and operational criteria air pollutant. 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 health risk assessment. This includes the summary of the dispersion modeling and the cancer risk calculations for construction and operation. The AERMOD dispersion modeling files for this assessment, which are quite voluminous, are available upon request and would be provided in digital format.

Attachment 5 includes the cumulative health risk calculations, modeling results, and health risk calculations from sources affecting the construction MEIs and project receptors.

Attachment 1: Health Risk Calculation Methodology

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.[37] 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.[38] 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.[39] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

<u>Cancer Risk</u>

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.

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[37] 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.
[38] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[39] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways). For workers, assumed to be adults, a 25-year exposure period is recommended by the BAAQMD. For school children a 9-year exposure period is recommended by the BAAQMD.

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

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

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

Where:

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

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

Where:

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

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

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

Parameter		Infant		Child	Adult
	Exposure Type →	**Infant**		**Child**	**Adult**
	Age Range →	**3rd Trimester**	**0<2**	**2 < 16**	**16 - 30**
DPM Cancer Potency Factor (mg/kg-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*

* For worker exposures (adult) the exposure duration and frequency are 25 years 250 days/year and FAH is not applicable.

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 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.