Appendix A: Construction Community Risk Assessment

171-175 MONROE STREET SINGLE-FAMILY HOMES CONSTRUCTION COMMUNITY RISK ASSESSMENT

Santa Clara, California

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Introduction

The purpose of this report is to address the potential community risk impacts associated with the construction of the proposed single-family homes located at 171-175 Monroe Street in Santa Clara, California. The air quality impacts from this project would be associated with construction of the new buildings. Air pollutant emissions associated with construction of the project were predicted using appropriate computer models. In addition, the potential project construction health risk impacts and the impact 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] BAAQMD recommends using a 1,000-foot screening radius around the project site for purposes of identifying community health risk from existing sources of TACs.

Project Description

The approximately 0.4-acre project site is currently occupied by two single family homes and a detached garage. The project proposes to demolish the existing houses and garage to construct eight single-family homes with enclosed garages. Construction is proposed to begin in October 2021 and be completed by August 2022.

Setting

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

Air Pollutants of Concern

High ozone levels are caused by the cumulative emissions of reactive organic gases (ROG) and nitrogen oxides (NO_X). These precursor pollutants react under certain meteorological conditions to form high ozone levels. Controlling the emissions of these precursor pollutants is the focus of the Bay Area's attempts to reduce ozone levels. The highest ozone levels in the Bay Area occur in the eastern and southern inland valleys that are downwind of air pollutant sources. High ozone levels aggravate respiratory and cardiovascular diseases, reduced lung function, and increase coughing and chest discomfort.

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

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

Toxic Air Contaminants

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (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.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors to the project site are in the single and multi-family residences to the north, south, and east of the project site. Washington Elementary School and Buchser Middle School are also near the project site. This project would introduce new sensitive receptors (i.e., residents) to the area.

Regulatory Setting

Federal Regulations

The United States Environmental Protection Agency (EPA) sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, 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.[2]

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

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

State Regulations

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.[3] 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.

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

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

CARB has also adopted and implemented regulations to reduce DPM and NO_X emissions from in-use (existing) and new off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower (hp) or greater. The regulations are intended to reduce particulate matter and NO_X exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve specified fleet-averaged emission rates. Implementation of this regulation, in conjunction with stringent federal off-road equipment engine emission limits for new vehicles, will significantly reduce emissions of DPM and NO_X.

Bay Area Air Quality Management District (BAAQMD)

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

BAAQMD is the lead agency in developing plans to address attainment and maintenance of the National Ambient Air Quality Standards 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.[4] The program examines TAC emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations. Risk reduction activities associated with the CARE program are focused on the most at-risk communities in the Bay Area. The BAAQMD has identified six communities as impacted: Concord, Richmond/San Pablo, Western Alameda County, San José, Redwood City/East Palo Alto, and Eastern San Francisco. The project site is within the San José CARE area.

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[5] 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

[4] See BAAQMD: https://www.baaqmd.gov/community-health/community-health-protection-program/community-air-risk-evaluation-care-program , accessed 2/18/2021.
[5] Bay Area Air Quality Management District, 2017. *CEQA Air Quality Guidelines*. May.

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 community risk modeling methodology.

City of Santa Clara 2010 – 2035 General Plan.

On November 16, 2010, the City of Santa Clara adopted the *City of Santa Clara 2010 – 2035 General Plan.*[6] The general plan includes goals, policies, and actions to reduce air pollutants and exposure to toxic air containments. The following goals, policies, and actions are applicable to the proposed project and this assessment:

5.10.2 Air Quality Goals

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

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

5.10.2 Air Quality Policies

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

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

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

Significance Thresholds

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

[6] City of Santa Clara, 2010. *City of Santa Clara 2010 – 2035 General Plan*. November. Web: https://www.santaclaraca.gov/home/showdocument?id=56139

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
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 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 $\mu g/m^3$	0.8 $\mu g/m^3$	

Construction Community Risk Impacts and Mitigation Measures

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

Additionally, the project could introduce new residents that are sensitive receptors, who would be exposed to existing sources of TACs and localized air pollutants in the vicinity of the project. Therefore, the impact of the existing sources of TAC upon the existing sensitive receptors and new incoming sensitive receptors was assessed.

Community risk impacts are addressed by predicting increased lifetime cancer risk, the increase in annual $PM_{2.5}$ concentrations, and computing the Hazard Index (HI) for non-cancer health risks. Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust emissions pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. A health risk assessment of the project construction activities was conducted that evaluated potential health effects to nearby sensitive receptors from construction emissions of DPM and $PM_{2.5}$.[7] This assessment included dispersion modeling to predict the offsite concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated. The methodology for computing community risks impacts is contained in *Attachment 1*.

Construction Period Emissions

The California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was used to estimate emissions from on-site construction activity, construction vehicle trips, and evaporative emissions. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The CARB EMission FACtors 2021 (EMFAC2021) model was used to predict emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[8] The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2021 vehicle emissions modeling outputs are included in *Attachment 3*.

CalEEMod Modeling

Land Use Inputs

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

[7] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.
[8] See CARB's EMFAC2021 Emissions Inventory at https://arb.ca.gov/emfac/emissions-inventory.

Table 2. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet (sf)	Acreage
Single Family Housing	8	Dwelling Unit	15,494	0.4
Enclosed Parking Structure	18	Parking Space	3,432	

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 for both phases, including equipment list and schedule, were based on information provided by the project applicant.

The construction equipment worksheets provided by the applicant included the schedule for each phase. Within each phase, the quantity of equipment to be used along with the average hours per day and total number of workdays was 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 October 2021 and would be built out over a period of approximately 10 months, or 213 construction workdays. The earliest year of full operation was assumed to be 2023.

Construction Truck Traffic Emissions

Construction would produce traffic in the form of worker trips and truck traffic. The traffic-related emissions are based on worker and vendor trip estimates produced by CalEEMod and haul trips that were computed based on the 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 for demolition and grading 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. Therefore, the construction traffic information was combined with EMFAC2021 motor vehicle emissions factors. EMFAC2021 provides aggregate emission rates in grams per mile for each vehicle type. The vehicle mix for this study was based on CalEEMod default assumptions, where worker trips are assumed to be comprised of light-duty autos (EMFAC category LDA) and light duty trucks (EMFAC category LDT1and LDT2). Vendor trips are comprised of delivery and large trucks (EMFAC category MHDT and HHDT) and haul trips, including 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 (soil import/export). Since CalEEMod does not address cement trucks, these were treated as vendor travel distances. Each trip was assumed to include an idle time of 5 minutes. Emissions associated with vehicle starts were also included. On road emissions in Santa Clara County for 2021 were used in these calculations. Table 3 provides the traffic inputs that were combined with the EMFAC2021 emission database to compute vehicle emissions.

Table 3. Construction Traffic Data Used for EMFAC2021 Model Runs

CalEEMod Run/Land Uses and Construction Phase	Trips by Trip Type			Notes
	Total Worker[1]	Total Vendor[1]	Total Haul[2]	
Vehicle mix[1]	50% LDA 25% LDT1 25% LDT2	50% MHDT 50% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0	CalEEMod default distance with 5-min truck idle time.
Demolition	15	-	20	2,200 sq-ft existing building and 200 tons pavement building demolition. CalEEMod default worker trips.
Site Preparation	24	-	1	10-cy soil export. CalEEMod default worker trips.
Grading	120	-	10	80-cy soil export. CalEEMod default worker trips.
Trenching	65	-	-	CalEEMod default worker trips.
Building Construction	480	120	138	69 cement round trips. CalEEMod default worker and vendor trips.
Architectural Coating	47	-	-	CalEEMod default worker trips
Paving	70	-	7	3 asphalt round trips. CalEEMod default worker trips.

Notes: [1] Based on 2021 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 asphalt trips estimated based on data provided by the applicant.

Summary of Computed Construction Period Emissions

Average daily emissions were computed by dividing the total construction emissions by the number of active construction workdays (213 days). Table 4 shows the 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 project construction emissions would not exceed the BAAQMD significance thresholds during construction.

Table 4. Construction Period Emissions

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Total Construction Emissions (tons)	0.15	0.35	0.01	0.01
Average daily emissions (pounds)[1]	1.40	3.29	0.14	0.13
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No

Notes: [1]Assumes 213 workdays.

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. *Recommended Measure AQ-1 would implement BAAQMD-recommended enhanced 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 Recommended 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.

Community Health Risk from Project Construction

Construction Emissions

The CalEEMod model and EMFAC2021 emissions provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages as 0.01 tons (28 pounds). The on-road emissions are a result of haul truck travel during grading activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod as 0.001 tons (2 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at sensitive receptors 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.[9] Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

Construction Sources

Combustion equipment DPM exhaust emissions were modeled as a series of point sources with a nine-foot release height (construction equipment exhaust stack height) placed at 23 feet (7 meter) intervals throughout the construction site. This resulted in 35 individual point sources being used to represent mobile equipment DPM exhaust emissions in the respective construction area, with DPM emissions occurring throughout the project construction site. In addition, the following stack

[9] Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May.

parameters were used: a vertical release, a stack diameter of 2.5 inches, an exhaust temperature of 918˚F, and an exit velocity of 309 feet per second. Since these are point sources plume rise is calculated by the AERMOD dispersion model. Emissions from vehicle travel on- and off-site were also distributed among the point sources throughout the site. The locations of the point 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 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 data set (2013 - 2017) of hourly meteorological data from the San Jose International Airport prepared for use with the AERMOD model by BAAQMD. Construction emissions were modeled as occurring daily between 7:00 a.m. to 5:00 p.m., when the majority of construction activity is expected to occur as provided by the applicant. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2021-2022 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors. Receptor heights of 5 feet (1.5 meters) and 15 feet (4.5 meters) were used to represent the breathing height on the first and second floor of nearby single-family and multi-family residences.[10] A receptor height of 3 feet (1 meter) was used to represent the breathing height of children at the nearby elementary and middle schools.

Summary of Construction Community Risk Impacts

The maximum increased cancer risks were calculated using the modeled TAC concentrations combined with the Office of Environmental Health Hazard Assessment (OEHHA) guidance for age sensitivity factors and exposure parameters as recommended by BAAQMD (see *Attachment 1)*. Non-cancer health hazards and maximum $PM_{2.5}$ concentrations were also calculated and identified. Age-sensitivity factors reflect the greater sensitivity of infants and 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. Students at the elementary and middle schools were assumed to be five years and older. The child (ages 2 through 16 years old) cancer risk parameters were used to calculate the increased cancer risk for the school students.

[10] 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

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

The maximum modeled annual DPM and $PM_{2.5}$ concentrations, which includes both the DPM and fugitive $PM_{2.5}$ concentrations, were identified at nearby sensitive receptors (as shown in Figure 1) to find the maximally exposed individuals (MEI). Results of this assessment indicated that the construction MEI was located on the second floor (15 feet above ground) of a multi-family home south of the project site. Table 5 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities affecting the construction MEI. *Attachment 4* to this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

Additionally, modeling was conducted to predict the cancer risks, non-cancer health hazards, and maximum $PM_{2.5}$ concentrations associated with construction activities at the nearby schools. The maximum increased cancer risks were adjusted using child exposure parameters. The uncontrolled cancer risk, $PM_{2.5}$ concentration, and HI at the nearby schools do not exceed their respective BAAQMD single-source significance thresholds, as shown in Table 5.

Table 5. Construction Risk Impacts at the Off-site MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impact				
Project Construction	Unmitigated	**12.90 (infant)**	0.08	0.02
	Mitigated*	2.81 (infant)	0.02	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated*	*No*	*No*	*No*
Most Affected Nearby School – Washington Elementary School				
Project Construction	Uncontrolled	0.01 (child)	<0.01	<0.01
BAAQMD Single-Source Threshold		***10.0***	***0.3***	***1.0***
Exceed Threshold?	Uncontrolled	*No*	No	No

* Construction equipment with Tier 4 interim engines and Best Management Practices as Mitigation.

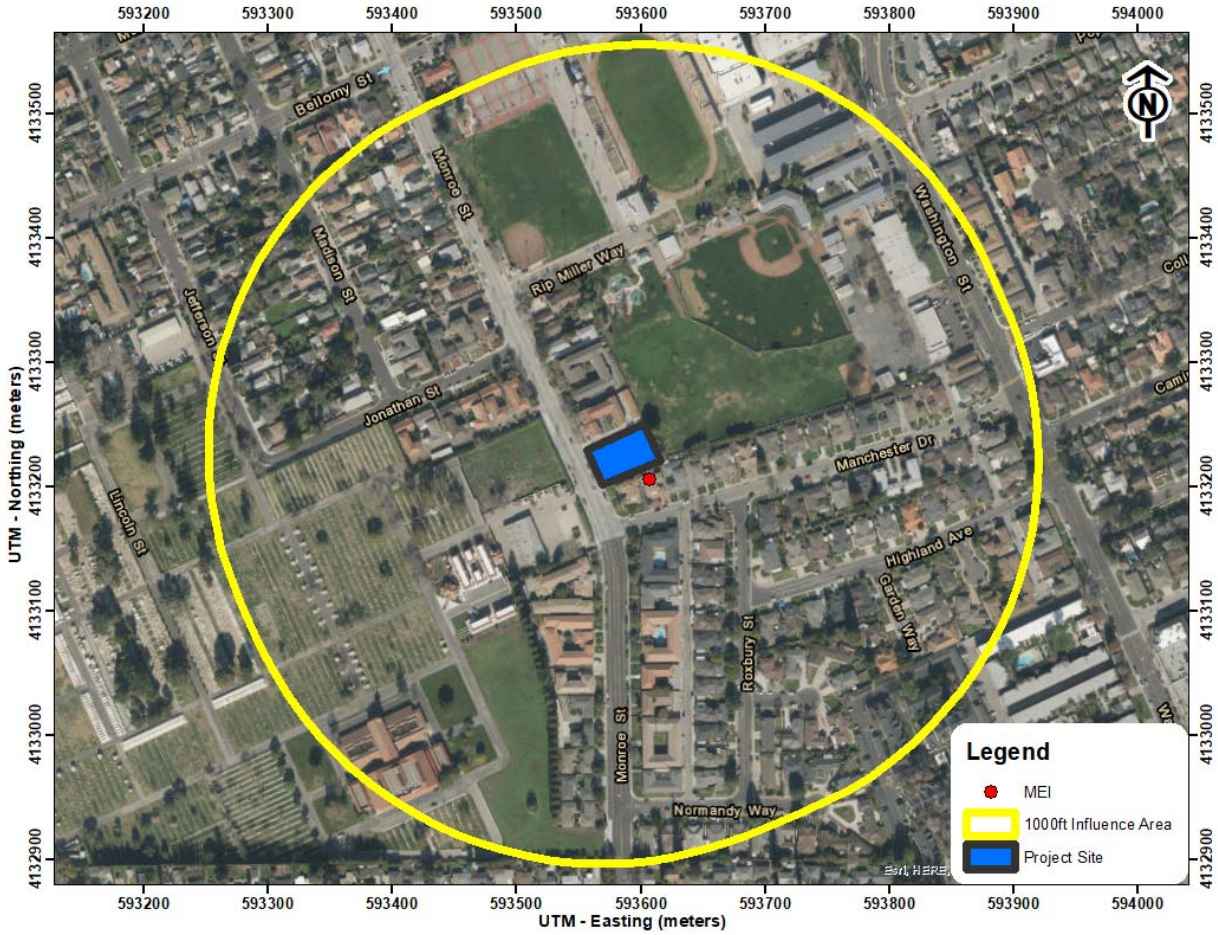
Figure 1. Locations of Project Construction Site, Off-Site Sensitive Receptors, and Maximum TAC Impact

Cumulative Community Risks of all TAC Sources at the Offsite Project MEI

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

A review of the project area and based on provided traffic information indicated that no roadways within the influence area would have traffic exceeding 10,000 vehicles per day. A review of BAAQMD's stationary source geographic information systems (GIS) map tool identified no stationary sources with the potential to affect the project site and MEI. Figure 2 shows the project area included within the influence area and the location of the MEI. Details of the modeling and community risk calculations are included in *Attachment 5*.

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



BAAQMD Permitted Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2018* GIS website,[11] 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. No sources within the project's 1000-foot influence area were identified using this tool.

Summary of Cumulative Health Risk Impact at Construction MEI

Table 6 reports both the project and cumulative community risk impacts at the sensitive receptors most affected by construction (i.e., the MEI). The project would have an exceedance with respect to community risk caused by project construction activities, since the maximum unmitigated cancer risk exceeds the BAAQMD single-source threshold. With the implementation of *Mitigation Measure AQ-1 and AQ-2*, the project's cancer risks would be lowered to a level below the single-

[11] BAAQMD, https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65

source thresholds. The HI and annual $PM_{2.5}$ concentrations, unmitigated and mitigated, do not exceed their cumulative threshold.

Table 6. Impacts from Combined Sources at Project MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Impacts				
Project Construction	Unmitigated	**12.90 (infant)**	0.08	0.02
	Mitigated	2.81 (infant)	0.02	<0.01
BAAQMD Single-Source Threshold		***10***	***0.3***	***1.0***
Exceed Threshold?	Unmitigated	***Yes***	*No*	*No*
	Mitigated	*No*	*No*	*No*
BAAQMD Cumulative Source Threshold		***100***	***0.8***	***10.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
	Mitigated	*No*	*No*	*No*

Mitigation Measure AQ-2: **Use construction equipment that has low diesel particulate matter exhaust to minimize emissions**

A feasible plan to reduce emissions such that increased cancer risk and annual $PM_{2.5}$ concentrations from construction would be reduced below significance levels is 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 particulate matter (PM_{10} and $PM_{2.5}$), if feasible, otherwise,

    a. If use of Tier 4 equipment is not available, alternatively use equipment that meets U.S. EPA emission standards for Tier 2 or 3 engines and include particulate matter emissions control equivalent to CARB Level 3 verifiable diesel emission control devices that altogether achieve an 25 percent reduction in particulate matter exhaust in comparison to uncontrolled equipment; alternatively (or in combination).

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

Alternatively, the applicant could develop a separate feasible plan that reduces on- and near-site construction diesel particulate matter emissions by 25 percent or greater. Such a plan would have to be reviewed and approved by the City.

Effectiveness of Mitigation Measure AQ-1 and AQ-2

CalEEMod was used to compute emissions associated with this mitigation measure assuming that all equipment met U.S. EPA Tier 4 interim engines standards and BAAQMD best management practices for construction were included. With these implemented, the project's construction cancer risk impact, assuming infant exposure, would be reduced by 79 percent to 2.81 per million. A plan that reduces DPM emissions by 25 percent would reduce cancer risk to about 9.7 chances per million. As a result, the project's construction cancer risk would be reduced below the BAAQMD single-source threshold.

On-Site Community Health Risk Impacts – New Project Residents

A health risk assessment would have been completed to assess the impact existing TAC sources would have on the new proposed sensitive receptors (residents) that that project would introduce. However, there are no existing TAC sources (i.e., roadways with over 10,000 daily vehicles or permitted BAAQMD stationary sources) within 1,000 feet of the project site. Therefore, an on-site community health risk impact was not conducted.

Supporting Documentation

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

Attachment 2 includes the CalEEMod output for project construction emissions. Also included are any modeling assumptions.

Attachment 3 includes the EMFAC2021 emissions modeling. The input files for these calculations are voluminous and are available upon request in digital format.

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

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

Attachment 1: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[12] 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.[13] 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.[14] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

Cancer Risk

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

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

[12] 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.
[13] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[14] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

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

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

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

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

Where:

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

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

Where:

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

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

Parameter	*Exposure Type* →	Infant		Child	Adult
	Age Range →	3rd Trimester	0<2	2 < 16	16 - 30
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day) 80th Percentile Rate		273	758	572	261
Daily Breathing Rate (L/kg-day) 95th Percentile Rate		361	1,090	745	335
8-hour Breathing Rate (L/kg-8 hours) 95th Percentile Rate		-	1,200	520	240
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14*
Exposure Frequency (days/year)		350	350	350	350*
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home (FAH)		0.85-1.0	0.85-1.0	0.72-1.0	0.73*
* An 8-hour breathing rate (8HrBR) is used for worker and school child exposures.					

Non-Cancer Hazards

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

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

Annual $PM_{2.5}$ Concentrations

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

Attachment 2: CalEEMod Modeling Inputs and Outputs

	Project Name:	171-175 Monroe Street, Santa Clara, CA					
	Project Size	**8**	**Dwelling Units**	**0.395**	**Acres disturbed**		
		15,494	**s.f. residential**	**0**	**s.f. retail**		
			s.f. office/commercial		**s.f. other, specify:**		
			s.f. other, specify:	**Common Areas**			
		3,432	**s.f. parking garage**	**18**	**spaces**		
		0	**s.f. parking lot**		**spaces**		
	Construction Hours	**7:00**	**am to**	**5:00**	**pm**		

Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Comments
	Demolition	**Start Date:**	**10/16/2021**	**Total phase:**	**5**		**Overall Import/Export Volumes**
		End Date:	**10/22/2021**				
	Concrete/Industrial Saws	81	0.73				**Demolition Volume**
1	Excavators	162	0.38	8	10	16	Square footage of buildings to be demolished
	Rubber-Tired Dozers	255	0.4			0	(*or* total tons to be hauled)
	Tractors/Loaders/Backhoes	97	0.37			0	**2200** square feet *or* **ex Building**
							0 Hauling volume (tons)
	Site Preperation	**Start Date:**	**10/21/2021**	**Total phase:**	**8**		Any pavement demolished and hauled? **200 tons**
		End Date:	**11/01/2021**				**Soil Hauling Volume**
	Graders	174	0.41	0	0	0	
	Rubber Tired Dozers	145	0.4	0	0	0	Export volume = **10** cubic yards
1	Tractors/Loaders/Backhoes	97	0.37	6	3.3	2.5	Import volume = **0** cubic yards
	Grading / Excavation	**Start Date:**	**10/29/2021**	**Total phase:**	**15**		
		End Date:	**11/18/2021**				**Soil Hauling Volume**
1	Scrapers	**361**	**0.48**			0	
1	Excavators	55	0.38	8	20	10.7	Export volume = **80** cubic yards
	Graders	60	0.41			0	Import volume = **0** cubic yards
	Rubber Tired Dozers	255	0.4			0	
1	Tractors/Loaders/Backhoes	97	0.37	8	15	8	
	Other Equipment?						
	Trenching / Ground Improvement	**Start Date:**	**11/15/2021**	**Total phase:**	**13**		
		End Date:	**12/1/2021**				
1	Tractor/Loader/Backhoe	77	0.37	8	5	3.1	
1	Excavators	NA				0	
	Crane for Caisons	NA	0	0	0	0	
	Building Structure / Exterior	**Start Date:**	**12/1/2021**	**Total phase:**	**120**		**Cement trucks**
		End Date:	**5/17/2022**				
14	Cement trucks	9	0.56	4	8	0.3	Electric Crane
	Cranes	226	0.29			0	
1	Forklifts	89	0.2	4	16	0.5	Diesel
	Generator Sets	84	0.74				
	Tractors/Loaders/Backhoes	97	0.37			0	
	Welders	46	0.45	0	0	0	
	Other Equipment?					0	
	Building - Interior/Architectural Coating	**Start Date:**	**5/17/2022**	**Total phase:**	**47**		concurent
		End Date:	**7/20/2022**				
3	Air Compressors	78	0.48	4	25	2.1	All Electric Equipment
2	Aerial Lift	62					
	Man lift	20					
	OffSite /Onsite Improvements	**Start Date:**	**7/20/2022**	**Total phase:**	**14**		
		End Date:	**8/8/2022**				
	Cement and Mortar Mixers	9	0.56				
	Pavers	NA	0.42				
1	Paving Equipment	130	0.36	6	5	2.1	
	Rollers	80	0.38				
1	Tractors/Loaders/Backhoes			8	5	2.9	
	Other Equipment?						

Equipment listed in this sheet is to provide an example of inputs
It is assumed that water trucks would be used during grading

Add or subtract phases and equipment, as appropriate
Modify horepower or load factor, as appropriate

Typical Equipment Type & Load Factors

OFFROAD Equipment Type	HP	Load Factor
Aerial Lifts	62	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	205	0.5
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	162	0.38
Forklifts	89	0.2
Generator Sets	84	0.74
Graders	174	0.41
Off-Highway Tractors	122	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	171	0.42
Other General Industrial Equipment	150	0.34
Other Material Handling Equipment	167	0.4
Pavers	125	0.42
Paving Equipment	130	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.2
Pumps	84	0.74
Rollers	80	0.38
Rough Terrain Forklifts	100	0.4
Rubber Tired Dozers	255	0.4
Rubber Tired Loaders	199	0.36
Scrapers	361	0.48
Signal Boards	6	0.82
Skid Steer Loaders	64	0.37
Skid Steer Loaders	64	0.37
Surfacing Equipment	253	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	80	0.5
Welders	46	0.45

Construction Criteria Air Pollutants						
Unmitigated	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	**CO2e**	
Year	Tons				MT	
Construction Equipment						
2021 - 2022	0.15	0.33	0.01	0.01	69.48	
EMFAC						
2021 - 2022	0.00	0.02	0.00	0.00	10.64	
Total Construction Emissions by Year						
2021 - 2022	0.15	0.35	0.01	0.01	80.12	
	Total Construction Emissions					
Tons	0.15	0.35	0.01	0.01	80.12	
Pounds/Workdays	*Average Daily Emissions*				Workdays	
2021 - 2022	1.40	3.29	0.14	0.13		**213**
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		
	Total Construction Emissions					
Pounds	1.40	3.29	0.14	0.13	0.00	
Average	1.40	3.29	0.14	0.13	0.00	213.00
Threshold - lbs/day	**54.0**	**54.0**	**82.0**	**54.0**		

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	8.00	Dwelling Unit	0.40	15,494.00	23
Enclosed Parking Structure	18.00	Space	0.00	3,432.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Unit amount, acreage, and square footage provided by applicant

Construction Phase - Phase start dates and lengths provided by applicant

Off-road Equipment - Construction equipment information provided by applicant

Off-road Equipment - Construction equipment information provided by applicant

Off-road Equipment - Construction equipment information provided by applicant

Off-road Equipment - Construction equipment information provided by applicant

Off-road Equipment - Construction equipment information provided by applicant

Off-road Equipment - Construction equipment information provided by applicant

Off-road Equipment - Construction equipment information provided by applicant

Grading -

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Demolition -

Trips and VMT - All trips entered into EMFAC2021

Construction Off-road Equipment Mitigation - All equipment t4i, BMP

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	5.00	47.00
tblConstructionPhase	NumDays	100.00	120.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	2.00	15.00
tblConstructionPhase	NumDays	5.00	14.00
tblConstructionPhase	NumDays	1.00	8.00
tblConstructionPhase	PhaseEndDate	4/6/2022	7/20/2022

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tblConstructionPhase	PhaseEndDate	3/23/2022	5/17/2022
tblConstructionPhase	PhaseEndDate	10/29/2021	10/22/2021
tblConstructionPhase	PhaseEndDate	11/3/2021	11/18/2021
tblConstructionPhase	PhaseEndDate	3/30/2022	8/8/2022
tblConstructionPhase	PhaseStartDate	3/31/2022	5/17/2022
tblConstructionPhase	PhaseStartDate	11/4/2021	12/1/2021
tblConstructionPhase	PhaseStartDate	11/2/2021	10/29/2021
tblConstructionPhase	PhaseStartDate	3/24/2022	7/20/2022
tblConstructionPhase	PhaseStartDate	10/30/2021	10/21/2021
tblGrading	MaterialExported	0.00	80.00
tblLandUse	LandUseSquareFeet	14,400.00	15,494.00
tblLandUse	LandUseSquareFeet	7,200.00	3,432.00
tblLandUse	LotAcreage	2.60	0.40
tblLandUse	LotAcreage	0.16	0.00
tblOffRoadEquipment	LoadFactor	0.31	0.31
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Scrapers
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	6.00	2.10

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tblOffRoadEquipment	UsageHours	6.00	0.50
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	2.90
tblOffRoadEquipment	UsageHours	8.00	2.50
tblTripsAndVMT	HaulingTripNumber	10.00	0.00
tblTripsAndVMT	HaulingTripNumber	10.00	0.00
tblTripsAndVMT	VendorTripNumber	1.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	0.00
tblTripsAndVMT	WorkerTripNumber	4.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	1.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0160	0.1606	0.1580	3.1000e-004	7.0500e-003	7.0800e-003	0.0141	8.1000e-004	6.5100e-003	7.3200e-003	0.0000	27.4480	27.4480	8.8800e-003	0.0000	27.6699
2022	0.1311	0.1737	0.1952	5.1000e-004	0.0000	6.8100e-003	6.8100e-003	0.0000	6.4300e-003	6.4300e-003	0.0000	44.4863	44.4863	0.0128	0.0000	44.8053
Maximum	**0.1311**	**0.1737**	**0.1952**	**5.1000e-004**	**7.0500e-003**	**7.0800e-003**	**0.0141**	**8.1000e-004**	**6.5100e-003**	**7.3200e-003**	**0.0000**	**44.4863**	**44.4863**	**0.0128**	**0.0000**	**44.8053**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	4.8800e-003	0.1084	0.1994	3.1000e-004	3.1700e-003	5.1000e-004	3.6900e-003	3.6000e-004	5.1000e-004	8.8000e-004	0.0000	27.4479	27.4479	8.8800e-003	0.0000	27.6699
2022	0.1189	0.1675	0.2982	5.1000e-004	0.0000	2.4800e-003	2.4800e-003	0.0000	2.4800e-003	2.4800e-003	0.0000	44.4862	44.4862	0.0128	0.0000	44.8052
Maximum	**0.1189**	**0.1675**	**0.2982**	**5.1000e-004**	**3.1700e-003**	**2.4800e-003**	**3.6900e-003**	**3.6000e-004**	**2.4800e-003**	**2.4800e-003**	**0.0000**	**44.4862**	**44.4862**	**0.0128**	**0.0000**	**44.8052**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**15.83**	**17.49**	**-40.90**	**0.00**	**55.04**	**78.47**	**70.53**	**55.56**	**76.89**	**75.56**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**10-16-2021**	**1-15-2022**	0.1873	0.1219
2	**1-16-2022**	**4-15-2022**	0.0790	0.0637
3	**4-16-2022**	**7-15-2022**	0.1899	0.1898
4	**7-16-2022**	**9-30-2022**	0.0218	0.0210
		Highest	0.1899	0.1898

2.2 Overall Operational

Unmitigated Operational

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1207	1.7200e-003	0.1281	1.4000e-004		0.0102	0.0102		0.0102	0.0102	1.0169	0.3470	1.3639	2.0200e-003	6.0000e-005	1.4316
Energy	1.1500e-003	9.8200e-003	4.1800e-003	6.0000e-005		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	11.3684	11.3684	2.2000e-004	2.1000e-004	11.4360
Mobile	0.0304	0.0336	0.2882	5.9000e-004	0.0637	4.3000e-004	0.0641	0.0170	4.0000e-004	0.0174	0.0000	55.2289	55.2289	3.5900e-003	2.6100e-003	56.0970
Waste						0.0000	0.0000		0.0000	0.0000	1.9609	0.0000	1.9609	0.1159	0.0000	4.8580
Water						0.0000	0.0000		0.0000	0.0000	0.1654	0.0000	0.1654	0.0170	4.0000e-004	0.7095
Total	**0.1522**	**0.0451**	**0.4206**	**7.9000e-004**	**0.0637**	**0.0114**	**0.0751**	**0.0170**	**0.0114**	**0.0284**	**3.1431**	**66.9444**	**70.0875**	**0.1387**	**3.2800e-003**	**74.5321**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1207	1.7200e-003	0.1281	1.4000e-004		0.0102	0.0102		0.0102	0.0102	1.0169	0.3470	1.3639	2.0200e-003	6.0000e-005	1.4316
Energy	1.1500e-003	9.8200e-003	4.1800e-003	6.0000e-005		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	11.3684	11.3684	2.2000e-004	2.1000e-004	11.4360
Mobile	0.0304	0.0336	0.2882	5.9000e-004	0.0637	4.3000e-004	0.0641	0.0170	4.0000e-004	0.0174	0.0000	55.2289	55.2289	3.5900e-003	2.6100e-003	56.0970
Waste						0.0000	0.0000		0.0000	0.0000	1.9609	0.0000	1.9609	0.1159	0.0000	4.8580
Water						0.0000	0.0000		0.0000	0.0000	0.1654	0.0000	0.1654	0.0170	4.0000e-004	0.7095

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Total	**0.1522**	**0.0451**	**0.4206**	**7.9000e-004**	**0.0637**	**0.0114**	**0.0751**	**0.0170**	**0.0114**	**0.0284**	**3.1431**	**66.9444**	**70.0875**	**0.1387**	**3.2800e-003**	**74.5321**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/16/2021	10/22/2021	5	5	
2	Site Preparation	Site Preparation	10/21/2021	11/1/2021	5	8	
3	Grading	Grading	10/29/2021	11/18/2021	5	15	
4	Building Construction	Building Construction	12/1/2021	5/17/2022	5	120	
5	Paving	Paving	7/20/2022	8/8/2022	5	14	
6	Architectural Coating	Architectural Coating	5/17/2022	7/20/2022	5	47	
7	Trenching	Trenching	11/15/2021	12/1/2021	5	13	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 11.25

Acres of Paving: 0

Residential Indoor: 31,375; Residential Outdoor: 10,458; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 206

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	3	2.10	78	0.48
Architectural Coating	Aerial Lifts	2	8.00	63	0.31

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Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	3.10	97	0.37
Building Construction	Forklifts	1	0.50	89	0.20
Grading	Scrapers	1	6.00	367	0.48
Paving	Paving Equipment	1	2.10	132	0.36
Demolition	Excavators	1	16.00	158	0.38
Grading	Excavators	1	10.70	158	0.38
Building Construction	Off-Highway Trucks	14	0.30	402	0.38
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	2.90	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	2.50	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	15	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0800e-003	0.0000	1.0800e-003	1.6000e-004	0.0000	1.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1500e-003	0.0108	0.0164	3.0000e-005		5.2000e-004	5.2000e-004		4.8000e-004	4.8000e-004	0.0000	2.2688	2.2688	7.3000e-004	0.0000	2.2872
Total	**1.1500e-003**	**0.0108**	**0.0164**	**3.0000e-005**	**1.0800e-003**	**5.2000e-004**	**1.6000e-003**	**1.6000e-004**	**4.8000e-004**	**6.4000e-004**	**0.0000**	**2.2688**	**2.2688**	**7.3000e-004**	**0.0000**	**2.2872**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.9000e-004	0.0000	4.9000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2000e-004	0.0114	0.0196	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.2688	2.2688	7.3000e-004	0.0000	2.2872
Total	**3.2000e-004**	**0.0114**	**0.0196**	**3.0000e-005**	**4.9000e-004**	**4.0000e-005**	**5.3000e-004**	**7.0000e-005**	**4.0000e-005**	**1.1000e-004**	**0.0000**	**2.2688**	**2.2688**	**7.3000e-004**	**0.0000**	**2.2872**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3000e-004	2.3700e-003	2.8300e-003	0.0000		1.4000e-004	1.4000e-004		1.3000e-004	1.3000e-004	0.0000	0.3412	0.3412	1.1000e-004	0.0000	0.3440
Total	**2.3000e-004**	**2.3700e-003**	**2.8300e-003**	**0.0000**	**0.0000**	**1.4000e-004**	**1.4000e-004**	**0.0000**	**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.3412**	**0.3412**	**1.1000e-004**	**0.0000**	**0.3440**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0000e-005	1.6900e-003	2.9300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	0.3412	0.3412	1.1000e-004	0.0000	0.3440
Total	**9.0000e-005**	**1.6900e-003**	**2.9300e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.3412**	**0.3412**	**1.1000e-004**	**0.0000**	**0.3440**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Grading - 2021

Unmitigated Construction On-Site

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.9700e-003	0.0000	5.9700e-003	6.4000e-004	0.0000	6.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9300e-003	0.0960	0.0892	1.6000e-004		4.2300e-003	4.2300e-003		3.8900e-003	3.8900e-003	0.0000	14.0898	14.0898	4.5600e-003	0.0000	14.2037
Total	**8.9300e-003**	**0.0960**	**0.0892**	**1.6000e-004**	**5.9700e-003**	**4.2300e-003**	**0.0102**	**6.4000e-004**	**3.8900e-003**	**4.5300e-003**	**0.0000**	**14.0898**	**14.0898**	**4.5600e-003**	**0.0000**	**14.2037**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6900e-003	0.0000	2.6900e-003	2.9000e-004	0.0000	2.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5600e-003	0.0555	0.1023	1.6000e-004		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004	0.0000	14.0897	14.0897	4.5600e-003	0.0000	14.2037
Total	**2.5600e-003**	**0.0555**	**0.1023**	**1.6000e-004**	**2.6900e-003**	**2.6000e-004**	**2.9500e-003**	**2.9000e-004**	**2.6000e-004**	**5.5000e-004**	**0.0000**	**14.0897**	**14.0897**	**4.5600e-003**	**0.0000**	**14.2037**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.7500e-003	0.0326	0.0226	8.0000e-005		1.2300e-003	1.2300e-003		1.1300e-003	1.1300e-003	0.0000	7.0992	7.0992	2.3000e-003	0.0000	7.1566
Total	**3.7500e-003**	**0.0326**	**0.0226**	**8.0000e-005**		**1.2300e-003**	**1.2300e-003**		**1.1300e-003**	**1.1300e-003**	**0.0000**	**7.0992**	**7.0992**	**2.3000e-003**	**0.0000**	**7.1566**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

21-095 175 Monroe St - Santa Clara County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3300e-003	0.0215	0.0431	8.0000e-005		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	7.0992	7.0992	2.3000e-003	0.0000	7.1566
Total	**1.3300e-003**	**0.0215**	**0.0431**	**8.0000e-005**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**7.0992**	**7.0992**	**2.3000e-003**	**0.0000**	**7.1566**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Category	tons/yr										MT/yr					
Off-Road	0.0138	0.1054	0.0890	3.4000e-004		3.9300e-003	3.9300e-003		3.6100e-003	3.6100e-003	0.0000	29.9506	29.9506	9.6900e-003	0.0000	30.1928
Total	**0.0138**	**0.1054**	**0.0890**	**3.4000e-004**		**3.9300e-003**	**3.9300e-003**		**3.6100e-003**	**3.6100e-003**	**0.0000**	**29.9506**	**29.9506**	**9.6900e-003**	**0.0000**	**30.1928**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	5.5900e-003	0.0905	0.1819	3.4000e-004		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004	0.0000	29.9506	29.9506	9.6900e-003	0.0000	30.1927
Total	**5.5900e-003**	**0.0905**	**0.1819**	**3.4000e-004**		**5.6000e-004**	**5.6000e-004**		**5.6000e-004**	**5.6000e-004**	**0.0000**	**29.9506**	**29.9506**	**9.6900e-003**	**0.0000**	**30.1927**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.4000e-004	7.4000e-003	0.0103	2.0000e-005		3.8000e-004	3.8000e-004		3.5000e-004	3.5000e-004	0.0000	1.3421	1.3421	4.3000e-004	0.0000	1.3529

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.4000e-004**	**7.4000e-003**	**0.0103**	**2.0000e-005**		**3.8000e-004**	**3.8000e-004**		**3.5000e-004**	**3.5000e-004**	**0.0000**	**1.3421**	**1.3421**	**4.3000e-004**	**0.0000**	**1.3529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7000e-004	6.7000e-003	0.0116	2.0000e-005		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	1.3421	1.3421	4.3000e-004	0.0000	1.3529

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.7000e-004**	**6.7000e-003**	**0.0116**	**2.0000e-005**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**1.3421**	**1.3421**	**4.3000e-004**	**0.0000**	**1.3529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1098					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	6.7300e-003	0.0609	0.0959	1.5000e-004		2.5000e-003	2.5000e-003		2.4600e-003	2.4600e-003	0.0000	13.1936	13.1936	2.6400e-003	0.0000	13.2596
Total	**0.1165**	**0.0609**	**0.0959**	**1.5000e-004**		**2.5000e-003**	**2.5000e-003**		**2.4600e-003**	**2.4600e-003**	**0.0000**	**13.1936**	**13.1936**	**2.6400e-003**	**0.0000**	**13.2596**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1098					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-Road	3.2800e-003	0.0703	0.1048	1.5000e-004		1.9000e-003	1.9000e-003		1.9000e-003	1.9000e-003	0.0000	13.1936	13.1936	2.6400e-003	0.0000	13.2596
Total	**0.1131**	**0.0703**	**0.1048**	**1.5000e-004**		**1.9000e-003**	**1.9000e-003**		**1.9000e-003**	**1.9000e-003**	**0.0000**	**13.1936**	**13.1936**	**2.6400e-003**	**0.0000**	**13.2596**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.8 Trenching - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9700e-003	0.0188	0.0270	4.0000e-005		9.6000e-004	9.6000e-004		8.9000e-004	8.9000e-004	0.0000	3.6490	3.6490	1.1800e-003	0.0000	3.6785

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Total	**1.9700e-003**	**0.0188**	**0.0270**	**4.0000e-005**		**9.6000e-004**	**9.6000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**3.6490**	**3.6490**	**1.1800e-003**	**0.0000**	**3.6785**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9000e-004	0.0183	0.0315	4.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	3.6490	3.6490	1.1800e-003	0.0000	3.6785
Total	**5.9000e-004**	**0.0183**	**0.0315**	**4.0000e-005**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**3.6490**	**3.6490**	**1.1800e-003**	**0.0000**	**3.6785**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

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Mitigated	0.0304	0.0336	0.2882	5.9000e-004	0.0637	4.3000e-004	0.0641	0.0170	4.0000e-004	0.0174	0.0000	55.2289	55.2289	3.5900e-003	2.6100e-003	56.0970
Unmitigated	0.0304	0.0336	0.2882	5.9000e-004	0.0637	4.3000e-004	0.0641	0.0170	4.0000e-004	0.0174	0.0000	55.2289	55.2289	3.5900e-003	2.6100e-003	56.0970

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Enclosed Parking Structure	0.00	0.00	0.00		
Single Family Housing	75.52	76.32	68.40	172,336	172,336
Total	75.52	76.32	68.40	172,336	172,336

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking Structure	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking Structure	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Single Family Housing	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	1.1500e-003	9.8200e-003	4.1800e-003	6.0000e-005		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	11.3684	11.3684	2.2000e-004	2.1000e-004	11.4360
NaturalGas Unmitigated	1.1500e-003	9.8200e-003	4.1800e-003	6.0000e-005		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	11.3684	11.3684	2.2000e-004	2.1000e-004	11.4360

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	213036	1.1500e-003	9.8200e-003	4.1800e-003	6.0000e-005		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	11.3684	11.3684	2.2000e-004	2.1000e-004	11.4360
Total		**1.1500e-003**	**9.8200e-003**	**4.1800e-003**	**6.0000e-005**		**7.9000e-004**	**7.9000e-004**		**7.9000e-004**	**7.9000e-004**	**0.0000**	**11.3684**	**11.3684**	**2.2000e-004**	**2.1000e-004**	**11.4360**

Mitigated

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	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	213036	1.1500e-003	9.8200e-003	4.1800e-003	6.0000e-005		7.9000e-004	7.9000e-004		7.9000e-004	7.9000e-004	0.0000	11.3684	11.3684	2.2000e-004	2.1000e-004	11.4360
Total		**1.1500e-003**	**9.8200e-003**	**4.1800e-003**	**6.0000e-005**		**7.9000e-004**	**7.9000e-004**		**7.9000e-004**	**7.9000e-004**	**0.0000**	**11.3684**	**11.3684**	**2.2000e-004**	**2.1000e-004**	**11.4360**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking Structure	18018	0.0000	0.0000	0.0000	0.0000
Single Family Housing	62665.8	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

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	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking Structure	18018	0.0000	0.0000	0.0000	0.0000
Single Family Housing	62665.8	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1207	1.7200e-003	0.1281	1.4000e-004		0.0102	0.0102		0.0102	0.0102	1.0169	0.3470	1.3639	2.0200e-003	6.0000e-005	1.4316
Unmitigated	0.1207	1.7200e-003	0.1281	1.4000e-004		0.0102	0.0102		0.0102	0.0102	1.0169	0.3470	1.3639	2.0200e-003	6.0000e-005	1.4316

6.2 Area by SubCategory

Unmitigated

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0110					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0607					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0472	1.0300e-003	0.0686	1.4000e-004		9.8900e-003	9.8900e-003		9.8900e-003	9.8900e-003	1.0169	0.2497	1.2666	1.9200e-003	6.0000e-005	1.3319
Landscaping	1.8100e-003	6.9000e-004	0.0596	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0974	0.0974	9.0000e-005	0.0000	0.0997
Total	**0.1207**	**1.7200e-003**	**0.1281**	**1.4000e-004**		**0.0102**	**0.0102**		**0.0102**	**0.0102**	**1.0169**	**0.3470**	**1.3639**	**2.0100e-003**	**6.0000e-005**	**1.4316**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0110					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0607					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0472	1.0300e-003	0.0686	1.4000e-004		9.8900e-003	9.8900e-003		9.8900e-003	9.8900e-003	1.0169	0.2497	1.2666	1.9200e-003	6.0000e-005	1.3319
Landscaping	1.8100e-003	6.9000e-004	0.0596	0.0000		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	0.0974	0.0974	9.0000e-005	0.0000	0.0997
Total	**0.1207**	**1.7200e-003**	**0.1281**	**1.4000e-004**		**0.0102**	**0.0102**		**0.0102**	**0.0102**	**1.0169**	**0.3470**	**1.3639**	**2.0100e-003**	**6.0000e-005**	**1.4316**

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7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.1654	0.0170	4.0000e-004	0.7095
Unmitigated	0.1654	0.0170	4.0000e-004	0.7095

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.521232 / 0.328603	0.1654	0.0170	4.0000e-004	0.7095
Total		**0.1654**	**0.0170**	**4.0000e-004**	**0.7095**

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Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.521232 / 0.328603	0.1654	0.0170	4.0000e-004	0.7095
Total		**0.1654**	**0.0170**	**4.0000e-004**	**0.7095**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.9609	0.1159	0.0000	4.8580
Unmitigated	1.9609	0.1159	0.0000	4.8580

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8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	9.66	1.9609	0.1159	0.0000	4.8580
Total		**1.9609**	**0.1159**	**0.0000**	**4.8580**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	9.66	1.9609	0.1159	0.0000	4.8580
Total		**1.9609**	**0.1159**	**0.0000**	**4.8580**

9.0 Operational Offroad

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Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 3: EMFAC2021 Calculations

Summary of Construction Traffic Emissions (EMFAC2021)

Pollutants YEAR	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio- CO2	CH4	N2O	CO2e
					Tons							*Metric Tons*		
Criteria Pollutants														
2021 & 2022	0.0017	0.0162	0.0206	0.0001	0.0044	0.0009	0.0053	0.0007	0.0004	0.0011	10.2471	0.0007	0.0013	10.6419
Toxic Air Contaminants (0.5 Mile Trip Length)														
2021 & 2022	0.0013	0.0032	0.0068	0.0000	0.0004	0.0001	0.0004	0.0001	0.0000	0.0001	1.0121	0.0002	0.0001	1.0595

CalEEMod Construction Inputs

Phase	CalEEMod WORKER TRIPS	CalEEMod VENDOR TRIPS	Total Worker Trips	Total Vendor Trips	CalEEMod HAULING TRIPS	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class	*Worker VMT*	*Vendor VMT*	*Hauling VMT*
Demolition	3	0	15	0	20	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	162	0	400
Site Preparation	3	0	24	0	1	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	259.2	0	20
Grading	8	0	120	0	10	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1296	0	200
Trenching/Foundation	5	0	65	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	702	0	0
Paving	5	0	70	0	7	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	756	0	140
Building Construction	4	1	480	120	138	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	5184	876	2760
Architectural Coating	1	0	47	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	507.6	0	0

Number of Days Per Year					
2021 & 2022	10/16/21	8/8/22	297	213	
			297	**213**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Demolition	10/16/2021	10/22/2021	5	5
Site Preparation	10/21/2021	11/1/2021	5	8
Grading	10/29/2021	11/18/2021	5	15
Trenching/Foundation	11/15/2021	12/1/2021	5	13
Paving	7/20/2022	8/8/2022	5	14
Building Construction	12/1/2021	5/17/2022	5	120
Architectural Coating	5/17/2022	7/20/2022	5	47

Source: EMFAC2021 (v1.0.1) Emission Rates
Region Type: County
Region: Santa Clara
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Con	NOx_RUNEX	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_PM	PM2.5_PM	PM10_RUN	PM10_IDLE	PM10_STR	PM10_PM	PM10_PMI	CO2_RUNEX	CO2_IDLEX	CO2_STREX	CH4_RUNEX	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTST	ROG_RUNL	ROG_DIUR	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTST	TOG_RUNL	TOG_DIUR	NH3_RUNEX	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Santa Clara	2021	HHDT	Aggregate	Aggregate	Gasoline	4.911671	108.3321	108.3321	0	98.2727	0	12.52129	0	1.17477	0.00724	0	0.001773	0.005	0.038424	0.007874	0	0.001929	0.02	0.109784	2565.57	0	49.38815	0.549631	0	0.000108	0.290212	0	0.031064	3.502409	0	0.00059	0.16728	1.506995	11.25307	5.110707	0	0.000646	0.16728	1.506995	11.25307	0.037857	118.2833	0	0.353757	0.025363	0	0.000488
Santa Clara	2021	HHDT	Aggregate	Aggregate	Diesel	7945.653	974275.6	974275.6	0	115958.9	0	2.842904	68.7602	2.347489	0.03733	0.061163	0	0.008769	0.028367	0.039018	0.063929	0	0.035076	0.081048	1695.883	12693.22	0	0.002265	0.236268	0	0.267187	1.999821	0	0.048759	5.086789	0	0	0	0	0.055509	5.790922	0	0	0	0	0	0.19614	0.195075	67.59912	0	0.016059	0.120197	0
Santa Clara	2021	HHDT	Aggregate	Aggregate	Natural Ga	604.4858	44859.32	44859.32	0	5247.791	0	1.479487	13.79137	0	0.002003	0.021244	0	0.009	0.047481	0.002179	0.023105	0	0.036	0.13566	1449.478	10245.18	0	2.851947	36.48951	0	0.295486	2.088546	0	0.068879	0.577467	0	0	0	0	2.94267	37.30415	0	0	0	0	0	0.853048	15.08309	73.72785	0	0	0	0
Santa Clara	2021	LDA	Aggregate	Aggregate	Gasoline	606788	22328684	22328684	0	2819031	0	0.061526	0	0.306099	0.001307	0	0.002137	0.002	0.002656	0.001421	0	0.002324	0.008	0.007589	291.5075	0	74.80132	0.003309	0	0.086516	0.005874	0	0.036086	0.013455	0	0.413042	0.102567	0.258475	1.575398	0.019625	0	0.452227	0.102567	0.258475	1.575398	0.031893	0.916686	0	3.92511	0.002882	0	0.000739
Santa Clara	2021	LDA	Aggregate	Aggregate	Diesel	2097.285	65438.93	65438.93	0	9106.701	0	0.289351	0	0	0.021136	0	0	0.002	0.002681	0.022092	0	0	0.008	0.007659	237.7247	0	0	0.00159	0	0	0.037454	0	0	0.034231	0	0	0	0	0	0.03897	0	0	0	0	0	0.0031	0.362693	0	0	0.002253	0	0
Santa Clara	2021	LDA	Aggregate	Aggregate	Electricity	45687.59	1848394	0	1848394	228454	713632.8	0	0	0	0	0	0	0.002	0.001529	0	0	0	0.008	0.00437	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	LDA	Aggregate	Aggregate	Plug-in Hyb	12325.75	549262.6	292344.2	256918.4	50966.97	77597.02	0.003493	0	0.11551	0.000782	0	0.002436	0.002	0.001363	0.00085	0	0.002649	0.008	0.003895	148.3928	0	67.90667	0.00048	0	0.042861	0.00064	0	0.021155	0.00151	0	0.173285	0.039575	0.034683	0.463886	0.002204	0	0.189725	0.039575	0.034683	0.463886	0.01985	0.228959	0	1.339893	0.001467	0	0.000671
Santa Clara	2021	LDT1	Aggregate	Aggregate	Gasoline	56250.2	1810349	1810349	0	251042.1	0	0.178236	0	0.45509	0.002102	0	0.003187	0.002	0.003233	0.002285	0	0.003465	0.008	0.009237	342.3532	0	92.17037	0.008673	0	0.128174	0.012178	0	0.042157	0.039434	0	0.681062	0.191773	0.56032	3.038222	0.057483	0	0.745671	0.191773	0.56032	3.038222	0.035289	1.855747	0	6.610145	0.003385	0	0.000911
Santa Clara	2021	LDT1	Aggregate	Aggregate	Diesel	32.08333	503.0685	503.0685	0	96.14776	0	1.666847	0	0	0.24162	0	0	0.002	0.003734	0.252545	0	0	0.008	0.010668	415.5911	0	0	0.014019	0	0	0.065477	0	0	0.301811	0	0	0	0	0	0.343592	0	0	0	0	0	0.0031	1.617036	0	0	0.003938	0	0
Santa Clara	2021	LDT1	Aggregate	Aggregate	Electricity	176.8774	5945.758	0	5945.758	835.4181	2295.553	0	0	0	0	0	0	0.002	0.001541	0	0	0	0.008	0.004403	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	LDT1	Aggregate	Aggregate	Plug-in Hyb	10.82472	516.8071	263.2288	253.5783	44.7602	76.5882	0.003342	0	0.11551	0.000498	0	0.001651	0.002	0.001365	0.000541	0	0.001795	0.008	0.0039	142.0049	0	74.72169	0.000461	0	0.043003	0.000616	0	0.021287	0.001445	0	0.173285	0.026876	0.026052	0.339589	0.021392	0.219103	0	0.189725	0.026876	0.026052	0.339589	0.021392	0.219103	0	1.339893	0.001404	0	0.000739
Santa Clara	2021	LDT2	Aggregate	Aggregate	Gasoline	269286.1	9644865	9644865	0	1261291	0	0.099372	0	0.421535	0.001357	0	0.002117	0.002	0.003124	0.001476	0	0.002303	0.008	0.008925	364.8211	0	94.21995	0.003765	0	0.098308	0.007574	0	0.041886	0.015421	0	0.472046	0.091479	0.236284	1.467935	0.023495	0	0.51683	0.091479	0.236284	1.467935	0.033775	1.034906	0	4.394297	0.003607	0	0.000931
Santa Clara	2021	LDT2	Aggregate	Aggregate	Diesel	883.652	33892.89	33892.89	0	4258.527	0	0.053343	0	0	0.00583	0	0	0.002	0.003073	0.006094	0	0	0.008	0.00878	323.8235	0	0	0.000676	0	0	0.051019	0	0	0.01456	0	0	0	0	0	0.016576	0	0	0	0	0	0.0031	0.133207	0	0	0.003068	0	0
Santa Clara	2021	LDT2	Aggregate	Aggregate	Electricity	295.5134	10300.33	0	10300.33	1512.362	3976.778	0	0	0	0	0	0	0.002	0.001524	0	0	0	0.008	0.004355	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	LDT2	Aggregate	Aggregate	Plug-in Hyb	845.8398	39165.03	20268.11	18896.92	3497.547	5707.433	0.003396	0	0.11551	0.000672	0	0.002194	0.002	0.001364	0.000731	0	0.002386	0.008	0.003897	144.2823	0	81.05617	0.000467	0	0.042925	0.000624	0	0.021215	0.001468	0	0.173285	0.027973	0.027304	0.362073	0.002143	0	0.189725	0.027973	0.027304	0.362073	0.021638	0.222617	0	1.339893	0.001426	0	0.000801
Santa Clara	2021	LHDT1	Aggregate	Aggregate	Gasoline	18933.42	672783.1	672783.1	0	282079.8	0	0.256798	0.039718	0.701068	0.001752	0	0.000385	0.002	0.0273	0.001905	0	0.000418	0.008	0.078	931.4507	122.4688	25.83191	0.012061	0.120812	0.03785	0.014272	0.003066	0.053341	0.061014	0.454849	0.191678	0.056457	0.299122	3.116304	0.089031	0.663714	0.209863	0.056457	0.299122	3.116304	0.044832	1.411296	3.747334	2.989075	0.009208	0.001211	0.000255
Santa Clara	2021	LHDT1	Aggregate	Aggregate	Diesel	9139.777	343382.9	343382.9	0	114966.9	0	2.358079	2.271347	0	0.04683	0.027404	0	0.003	0.0273	0.048947	0.028643	0	0.012	0.078	643.496	136.5842	0	0.010209	0.005098	0	0.101383	0.021519	0	0.219784	0.10976	0	0	0	0	0.25021	0.124954	0	0	0	0	0	0.146324	0.639056	0.909745	0	0.006097	0.001294	0
Santa Clara	2021	LHDT2	Aggregate	Aggregate	Gasoline	2466	87553.14	87553.14	0	36739.72	0	0.242157	0.039344	0.681173	0.001604	0	0.000316	0.002	0.03185	0.001745	0	0.000344	0.008	0.091	1035.79	141.0887	26.12054	0.009565	0.120729	0.036622	0.013821	0.003071	0.05226	0.045738	0.450754	0.183893	0.052329	0.275873	2.879115	0.066741	0.657739	0.20134	0.052329	0.275873	2.879115	0.044945	1.150578	3.751518	3.098774	0.01024	0.001395	0.000258
Santa Clara	2021	LHDT2	Aggregate	Aggregate	Diesel	4074.911	157442.8	157442.8	0	51257.26	0	1.819669	2.235115	0	0.039933	0.027151	0	0.003	0.03185	0.044738	0.028379	0	0.012	0.091	781.4731	217.5251	0	0.008888	0.005098	0	0.123121	0.034271	0	0.191344	0.10976	0	0	0	0	0.217833	0.124954	0	0	0	0	0	0.165331	0.517738	0.909745	0	0.007405	0.002061	0
Santa Clara	2021	MCY	Aggregate	Aggregate	Gasoline	27304.17	1603822.2	160382.2	0	54608.34	0	0.626062	0	0.157064	0.001755	0	0.003626	0.001	0.0042	0.001872	0	0.003843	0.004	0.012	189.7631	0	52.22767	0.180174	0	0.199348	0.041922	0	0.009146	1.214328	0	1.494194	3.559817	3.717016	3.986797	1.441721	0	1.623911	3.559817	3.717016	3.986797	0.008645	14.15601	0	8.172263	0.001876	0	0.000516
Santa Clara	2021	MDV	Aggregate	Aggregate	Gasoline	147596.4	5051242	5051242	0	682293.7	0	0.160894	0	0.57169	0.001434	0	0.002382	0.002	0.003201	0.001559	0	0.002589	0.008	0.009147	442.5348	0	114.8138	0.005886	0	0.129321	0.010684	0	0.047954	0.026856	0	0.67693	0.1118	0.299795	1.785601	0.038387	0	0.741109	0.1118	0.299795	1.785601	0.033755	1.329778	0	5.04226	0.004375	0	0.001135
Santa Clara	2021	MDV	Aggregate	Aggregate	Diesel	2291.714	86017.73	86017.73	0	11013.96	0	0.063349	0	0	0.005706	0	0	0.002	0.00312	0.005964	0	0	0.008	0.008916	420.7053	0	0	0.000573	0	0	0.066282	0	0	0.012335	0	0	0	0	0	0.014043	0	0	0	0	0	0.0031	0.203492	0	0	0.003986	0	0
Santa Clara	2021	MDV	Aggregate	Aggregate	Electricity	256.699	9069.305	0	9069.305	1316.884	3501.5	0	0	0	0	0	0	0.002	0.001522	0	0	0	0.008	0.004349	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	MDV	Aggregate	Aggregate	Plug-in Hyb	609.3868	26030.39	13830.97	12199.42	2519.814	3684.588	0.003487	0	0.11551	0.000845	0	0.002679	0.002	0.001363	0.00092	0	0.002914	0.008	0.003894	148.1394	0	101.4945	0.000477	0	0.042643	0.000633	0	0.020952	0.001508	0	0.173285	0.030476	0.030968	0.408082	0.0022	0	0.189725	0.030476	0.030968	0.408082	0.022316	0.228568	0	1.339893	0.001465	0	0.001003
Santa Clara	2021	MH	Aggregate	Aggregate	Gasoline	2769.699	23630.01	23630.01	0	627.6675	0	0.395766	0.002059	0	0.000494	0	0	0.003	0.015756	0.002239	0	0.000538	0.012	0.045017	1950.365	0	32.39866	0.025366	0	0.038961	0.034003	0	0.039426	0.120744	0	0.173868	15.32954	0.341293	5.193314	0.176189	0	0.190364	15.32954	0.341293	5.193314	0.044424	3.344602	0	3.937518	0.019281	0	0.00032
Santa Clara	2021	MH	Aggregate	Aggregate	Diesel	922.1828	8933.632	8933.632	0	92.21828	0	4.615076	0	0	0.111614	0	0	0.004	0.015675	0.116661	0	0	0.016	0.044785	1080.28	0	0	0.00602	0	0	0.170198	0	0	0.129617	0	0	0	0	0	0.14756	0	0	0	0	0	0.137198	0.438429	0	0	0.010236	0	0
Santa Clara	2021	MHDT	Aggregate	Aggregate	Gasoline	1442.735	67829.47	67829.47	0	28866.25	0	0.831489	0.087806	0.473646	0.001493	0	0.000635	0.003	0.015756	0.001624	0	0.00069	0.012	0.045017	1848.545	547.8914	49.28763	0.027494	0.244939	0.052883	0.036408	0.006525	0.031617	0.14124	1.002561	0.308525	0.045168	0.369912	3.607527	0.206097	1.462934	0.337796	0.045168	0.369912	3.607527	0.044883	3.016915	14.99869	6.909591	0.018275	0.005416	0.000487
Santa Clara	2021	MHDT	Aggregate	Aggregate	Diesel	10153.19	424633.4	424633.4	0	120691.4	0	1.894718	16.09448	1.444966	0.024213	0.051093	0	0.003	0.015941	0.025308	0.053403	0	0.012	0.045546	1160.391	2338.117	0	0.002807	0.014388	0	0.18282	0.368371	0	0.060425	0.309775	0	0	0	0	0.068789	0.352655	0	0	0	0	0	0.192868	0.190198	7.288171	0	0.010988	0.022141	0
Santa Clara	2021	MHDT	Aggregate	Aggregate	Natural Ga	78.33433	3644.537	3644.537	0	742.0488	0	0.168911	6.475626	0	0.000993	0.01576	0	0.003	0.016009	0.00108	0.01714	0	0.012	0.04574	1007.079	5194.634	0	0.721288	18.08715	0	0.2053	1.05896	0	0.010306	0.25843	0	0	0	0	0.736127	18.45926	0	0	0	0	0	1.06	2.987554	29.49823	0	0	0	0
Santa Clara	2021	OBUS	Aggregate	Aggregate	Gasoline	483.6838	22502.68	22502.68	0	9677.546	0	0.647154	0.064946	0.407221	0.000833	0	0.00026	0.003	0.01568	0.000906	0	0.000283	0.012	0.044799	1824.237	386.5099	32.42022	0.018667	0.194146	0.037204	0.030004	0.005187	0.030554	0.092334	0.744545	0.197731	0.034167	0.138331	2.476771	0.134734	1.086438	0.21649	0.034167	0.138331	2.476771	0.0449	2.094066	5.764227	4.193973	0.018034	0.003821	0.000321
Santa Clara	2021	OBUS	Aggregate	Aggregate	Diesel	834.688	61084.28	61084.28	0	8576.673	0	1.576242	9.183516	1.420449	0.027062	0.016448	0	0.003	0.018131	0.028286	0.017191	0	0.012	0.051804	1290.86	1635.121	0	0.003027	0.022612	0	0.203376	0.257614	0	0.065176	0.48683	0	0	0	0	0.074198	0.554219	0	0	0	0	0	0.206149	0.214603	7.255191	0	0.012224	0.015484	0
Santa Clara	2021	OBUS	Aggregate	Aggregate	Natural Ga	5.469371	354.9737	354.9737	0	48.6774	0	0.296201	1.581355	0	0.000557	0.002851	0	0.003	0.016148	0.000605	0.003101	0	0.012	0.046137	1044.502	1172.359	0	0.731981	4.779418	0	0.212928	0.238993	0	0.010459	0.068288	0	0	0	0	0.74704	4.877746	0	0	0	0	0	1.06	3.098562	4.989923	0	0	0	0
Santa Clara	2021	SBUS	Aggregate	Aggregate	Gasoline	153.6367	7565.4	7565.4	0	614.5466	0	0.533764	0.925451	0.67372	0.000841	0	0.00054	0.002	0.015721	0.000915	0	0.000587	0.008	0.044917	825.4164	2631.972	59.70541	0.013058	2.453844	0.074718	0.028424	0.08626	0.062288	0.063594	10.62574	0.427027	0.104098	0.223574	1.381476	0.092797	15.50505	0.467541	0.104098	0.223574	1.381476	0.045	1.630235	82.14507	10.90196	0.00816	0.02602	0.00059
Santa Clara	2021	SBUS	Aggregate	Aggregate	Diesel	657.6731	15431.13	15431.13	0	9523.107	0	4.438199	23.32594	0.434289	0.023358	0.024671	0	0.003	0.015721	0.024414	0.025786	0	0.012	0.044917	1157.296	2254.332	0	0.00292	0.008308	0	0.182332	0.355171	0	0.06286	0.178878	0	0	0	0	0.071561	0.203639	0	0	0	0	0	0.136384	0.189608	4.398329	0	0.010959	0.021347	0
Santa Clara	2021	SBUS	Aggregate	Aggregate	Natural Ga	21.69727	560.9301	560.9301	0	314.1765	0	0.631341	5.309646	0	0.003378	0.010433	0	0.003	0.015721	0.003674	0.011347	0	0.012	0.044917	1293.196	4040.723	0	3.611806	15.73509	0	0.263627	0.823728	0	0.051606	0.224823	0	0	0	0	3.686113	16.05882	0	0	0	0	0	1.06	12.47317	18.66291	0	0	0	0
Santa Clara	2021	UBUS	Aggregate	Aggregate	Gasoline	45.675	4769.83	4769.83	0	182.7	0	0.032133	0	0.568854	0.000898	0	8.87E-05	0.002	0.03185	0.000977	0	9.64E-05	0.008	0.091	974.9499	0	38.39745	0.002378	0	0.0539	0.00477	0	0.08329	0.006763	0	0.198578	0.052994	0.093754	0.610126	0.009869	0	0.217418	0.052994	0.093754	0.610126	0.045	0.578479	0	5.701642	0.009638	0	0.000038
Santa Clara	2021	UBUS	Aggregate	Aggregate	Diesel	434.6269	48602.56	48602.56	0	1738.508	0	0.386258	0	0	0.007023	0	0	0.0083	0.0385	0.00734	0	0	0.033201	0.11	1100.519	0	0	0.003215	0	0	0.173387	0	0	0.069208	0	0	0	0	0	0.078788	0	0	0	0	0	0.1877	0.079368	0	0	0.010428	0	0
Santa Clara	2021	UBUS	Aggregate	Aggregate	Electricity	5.046757	199.0027	0	199.0027	20.18703	346.9103	0	0	0	0	0	0	0.009	0.01925	0	0	0	0.036	0.055	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santa Clara	2021	UBUS	Aggregate	Aggregate	Natural Ga	41.43636	4737.889	4737.889	0	165.7455	0	0.058764	0	0	0.000282	0	0	0.00818	0.0385	0.000295	0	0	0.032718	0.11	1298.95	0	0	4.245038	0	0	0.264799	0	0	0.060653	0	0	0	0	0	4.332372	0	0	0	0	0	0.97	49.03001	0	0	0	0	0

Attachment 4: Project Construction Emissions and Health Risk Calculations

175 Monroe Street, Santa Clara, CA

DPM Construction Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Source Type	No. Sources	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Emissions per Point Source (g/s)
2021 & 2022	Construction	0.0139	Point	35	27.9	0.00763	9.62E-04	2.75E-05
Total		***0.0139***			***27.9***	***0.0076***	***0.0010***	

Emissions assumed to be evenly distributed over each construction areas

hr/day =	10	(7am - 5pm)
days/yr =	365	
hours/year =	3650	

175 Monroe Street, Santa Clara, CA

PM2.5 Fugitive Dust Construction Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate $g/s/m^2$
2021 & 2022	Construction	CON_FUG	0.0009	1.7	0.00047	5.93E-05	1583.2	3.74E-08
Total			***0.0009***	***1.7***	***0.0005***	***0.0001***		

Emissions assumed to be evenly distributed over each construction areas

hr/day =	10	(7am - 5pm)
days/yr =	365	
hours/year =	3650	

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Source Type	No. Sources	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Emissions per Point Source (g/s)
2021 & 2022	Construction	0.0030	Point	35	6.1	0.00166	2.09E-04	5.98E-06
Total		***0.0030***			***6.1***	***0.0017***	***0.0002***	

Emissions assumed to be evenly distributed over each construction areas

hr/day = 10 (7am - 5pm)
days/yr = 365
hours/year = 3650

PM2.5 Fugitive Dust Construction Emissions for Modeling - With Mitigation

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate $g/s/m^2$
2021 & 2022	Construction	CON_FUG	0.0004	0.8	0.00022	2.82E-05	1583.2	1.78E-08
Total			***0.0004***	***0.8***	***0.0002***	***0.0000***		

Emissions assumed to be evenly distributed over each construction areas

hr/day = 10 (7am - 5pm)
days/yr = 365
hours/year = 3650

175 Monroe Street, Santa Clara, CA
Construction Health Impact Summary

Maximum Impacts at MEI Location - Without Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Infant/Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2021 - 2022	0.0726	0.0071	12.90	0.21	0.01	0.08
Total	-	-	**12.90**	**0.21**		-
Maximum	0.0726	0.0071	**-**	**-**	**0.01**	**0.08**

Maximum Impacts at MEI Location - With Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Infant/Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2021 - 2022	0.0158	0.0034	2.81	0.05	0.00	0.02
Total	-	-	**2.81**	**0.05**	-	-
Maximum	0.0158	0.0034	**-**	**-**	**0.00**	**0.02**

- Tier 4 Interim Engine and BMP Mitigation

Maximum Impacts at Washington Elementary School

Construction Year	Unmitigated Emissions: Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Unmitigated Emissions: Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2021 - 2022	0.0001	0.0000	0.01	0.0000	0.000
Total	-	-	**0.01**	-	-
Maximum	0.0001	0.0000	**-**	**0.0000**	**0.000**

175 Monroe Street, Santa Clara, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 4.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information					Maximum	
			DPM Conc (ug/m3)		Age	Infant/Child	Modeled DPM Conc (ug/m3)		Age	Adult			
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Cancer Risk (per million)**	**Hazard Index**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	2021 - 2022	0.0726	10	0.99	2021 - 2022	0.0726	-	-			
1	1	0 - 1	2021 - 2022	0.0726	10	11.92	2021 - 2022	0.0726	1	0.21	0.015	0.007	0.08
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**12.90**				**0.21**			

* Third trimester of pregnancy

175 Monroe Street, Santa Clara, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information						
							Modeled				Maximum		
Exposure Year	Exposure Duration (years)	Age	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Hazard Index	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2021 - 2022	0.0300	10	0.41	2021 - 2022	0.0300	-	-			
1	1	0 - 1	2021 - 2022	0.0300	10	4.93	2021 - 2022	0.0300	1	0.09	0.01	0.009	0.04
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**5.34**				**0.09**			

* Third trimester of pregnancy

175 Monroe Street, Santa Clara, CA - Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 4.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
			DPM Conc (ug/m3)		Age	Infant/Child	Modeled		Age	Adult			
Exposure	Exposure				Sensitivity	Cancer	DPM Conc (ug/m3)		Sensitivity	Cancer	Hazard	Fugitive	Total
Year	Duration (years)	Age	Year	Annual	Factor	Risk (per million)	Year	Annual	Factor	Risk (per million)	Index	PM2.5	PM2.5
0	0.25	-0.25 - 0*	2021 - 2022	0.0158	10	0.21	2021 - 2022	0.0158	-	-			
1	1	0 - 1	2021 - 2022	0.0158	10	2.59	2021 - 2022	0.0158	1	0.05	0.003	0.00	0.02
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**2.81**				**0.05**			

* Third trimester of pregnancy

175 Monroe Street, Santa Clara, CA - Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

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

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

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

Values

	Infant/Child			Adult
Age –>	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum		
			DPM Conc (ug/m3)		Age	Infant/Child Cancer	Modeled DPM Conc (ug/m3)		Age	Adult Cancer			
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Hazard Index**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	2021 - 2022	0.0065	10	0.09	2021 - 2022	0.0065	-	-			
1	1	0 - 1	2021 - 2022	0.0065	10	1.07	2021 - 2022	0.0065	1	0.02	0.001	0.01	0.01
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00			
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00			
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00			
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00			
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00			
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00			
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00			
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00			
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00			
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00			
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00			
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00			
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00			
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00			
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00			
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00			
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00			
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00			
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00			
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00			
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00			
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00			
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00			
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00			
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00			
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00			
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00			
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00			
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00			
Total Increased Cancer Risk						**1.16**				**0.02**			

* Third trimester of pregnancy

175 Monroe Street, Santa Clara, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Washington Elementary School - 1 meter - Child Exposure

Student Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x 1.0E6

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

Inhalation Dose = C_{air} x SAF x 8-Hr BR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
SAF = Student Adjustment Factor (unitless)
= (24 hrs/9 hrs) x (7 days/5 days) = 3.73
8-Hr BR = Eight-hour breathing rate (L/kg body weight-per 8 hrs)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	School Infant	School Child	Adult
Age -->	**0 - <2**	**2 - <16**	**16 - 30**
Parameter			
ASF =	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00
8-Hr BR* =	1200	520	240
A =	1	1	1
EF =	250	250	250
AT =	70	70	70
SAF =	3.73	3.73	1.00

* 95th percentile 8-hr breathing rates for moderate intensity activities

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)
1	1	5 - 6	2021-2022	0.0001	3	0.0
2	1			0.0000	3	0.0
3	1			0.0000	3	0.0
4	1			0.0000	3	0.0
5	1			0.0000	3	0.0
6	1			0.0000	3	0.0
7	1			0.0000	3	0.0
8	1			0.0000	3	0.0
9	1			0.0000	3	0.0
Total Increased Cancer Risk						**0.01**

* Children assumed to be 5 years of age or older with +1 years of Construction Exposure

Maximum		
Hazard Index	**Fugitive PM2.5**	**Total PM2.5**
0.0000	0.0000	0.000

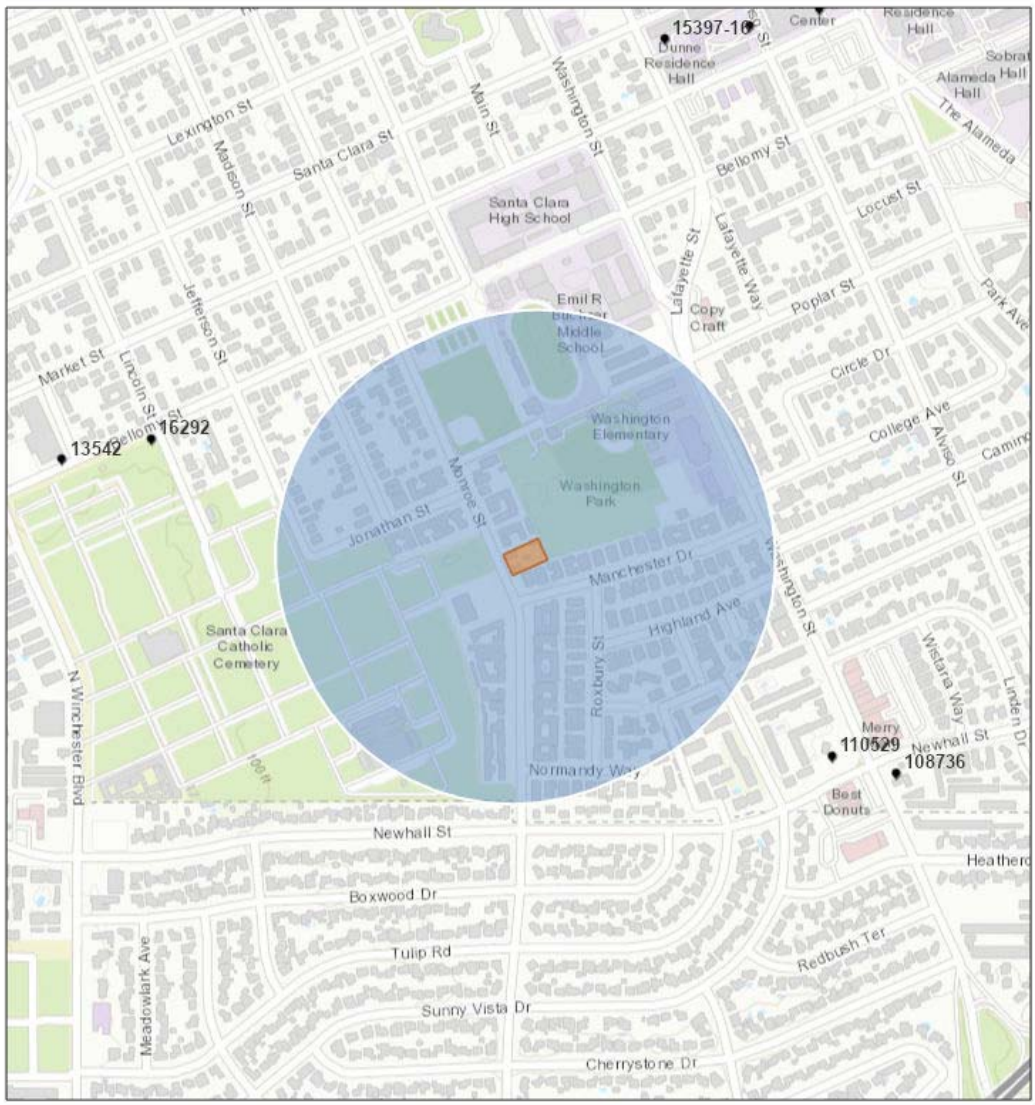
Attachment 5: Community Risk Modeling Information and Calculations

Stationary Source Risk & Hazards Screening Report

Area of Interest (AOI) Information

Area : 3,686,655.34 ft²

Aug 27 2021 15:41:41 Eastern Daylight Time



Summary

Name	Count	Area(ft²)	Length(ft)
Permitted Facilities 2018	0	N/A	N/A

Note: The estimated risk and hazard impacts from these sources would be expected to be substantially lower when site specific Health Risk Screening Assessments are conducted.

The screening level map is not recommended for evaluating sensitive land uses such as schools, senior centers, day cares, and health facilities.