NEIGHBORHOOD AT LOS GAMOS AIR QUALITY & GREENHOUSE GAS ASSESSMENT

San Rafael, California

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Introduction

The purpose of this report is to address air quality, community health risk, and greenhouse gas (GHG) impacts associated with the Neighborhood at Los Gamos project located near the southern terminus of Los Gamos Drive in San Rafael, California. The air quality impacts and GHG emissions would be associated with the construction of new building and infrastructure and operation of the project. Air pollutant and GHG emissions associated with the construction and operation of the project were predicted using appropriate computer models. In addition, the potential project health risk impact (including construction and operation) and the impacts of existing toxic air contaminant (TAC) sources affecting the nearby and proposed sensitive receptors were evaluated. This analysis addresses those issues following the guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Project Description

The project site is currently vacant. The project proposes to construct 192 multi-family dwelling units in five, three to four story apartment buildings, of which the project will meet city requirements for affordable housing at the time of approval. There would be a centralized community center building with a community room, patio, and a 4,323 square-foot (sf) market and coffee shop. The project includes 171 covered parking spaces and 53 parking lot spaces, for a total of 224 parking spaces.

Setting

The project is located in Marin 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, reduce 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

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

aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

Toxic Air Contaminants

TACs are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter [DPM] near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level.

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

Regulatory Agencies

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 nitrogen oxides, or NO_X, and particulate matter (PM_{10} and $PM_{2.5}$) and because the EPA has identified diesel particulate matter 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 PM and NO_X emissions from diesel engines up to 95 percent in

[2] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards.[3]

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

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

State Regulations

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

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy-duty diesel trucks that represent the bulk of DPM emissions from California highways. CARB regulations require on-road diesel trucks to be retrofitted with particulate matter controls or replaced to meet 2010 or later engine standards that have much lower DPM and $PM_{2.5}$ emissions. This regulation will substantially reduce these emissions between 2013 and 2023. While new trucks and buses will meet strict federal standards, this measure is intended to accelerate the rate at which the fleet either turns over so there are more cleaner vehicles on the road or is retrofitted to meet similar standards. With this regulation, older, more polluting trucks would be removed from the roads sooner.

CARB has also adopted and implemented regulations to reduce DPM and NO_X emissions from in-use (existing) and new off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles

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

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

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.

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 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.

San Rafael General Plan 2020

The San Rafael General Plan 2020 includes policies to reduce exposure of the City's sensitive population to exposure of air pollution and toxic air contaminants. The following policies are applicable to the proposed project:

AW-1. *State and Federal Standards.* Continue to comply and strive to exceed state and federal standards for air quality for the benefit of the Bay Area.

AW-1a. *Cooperation with Other Agencies.* Cooperate with the Bay Area Air Quality Management District (BAAQMD) and other agencies in their efforts to ensure compliance with existing air quality regulations.

AW-2. *Land Use Compatibility.* To ensure excellent air quality, promote land use compatibility for new development by using buffering techniques such as

[5] Bay Area Air Quality Management District, 2011. *CEQA Air Quality Guidelines*. May. (Updated May 2017)

landscaping, setbacks, and screening in areas where different land uses abut one another.

AW-2a. *Sensitive Receptors.* Through development review, ensure that siting of any new sensitive receptors provides for adequate buffers from existing sources of toxic air contaminants or odors. If development of a sensitive receptor (a facility or land use that includes members of the population sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses) is proposed within 500 feet of U.S. Highway 101 or I-580, an analysis of mobile source toxic air contaminant health risks should be performed. Development review should include an evaluation of the adequacy of the setback from the highway and, if necessary, identify design mitigation measures to reduce health risks to acceptable levels.

AW-2b. *Buffers.* Through development review, ensure that any proposed new sources of toxic air contaminants or odors provide adequate buffers to protect sensitive receptors and comply with existing health standards.

AW-3. *Air Quality Planning with Other Processes.* Integrate air quality considerations with the land use and transportation processes by mitigating air quality impacts through land use design measures, such as encouraging project design that will foster walking and biking.

AW-3a. *Air Pollution Reduction Measures.* Consider revisions to zoning regulations to require developers to implement strategies for air quality improvement described in the BAAQMD/ABAG's guide "Design Strategies for Encouraging Alternatives to Auto Use Through Local Development Review" or subsequent standards.

AW-3b. *Smart Growth and Livable Communities Programs.* Participate in and implement strategies of Metropolitan Transportation Commission's regional "Smart Growth Initiative" and "Transportation for Livable Communities Program."

AW-4. *Particulate Matter Pollution Reduction.* Promote the reduction of particulate matter pollution from roads, parking lots, construction sites, agricultural lands and other activities.

AW-4a. *Pollution Reduction.* Through development review, ensure that any proposed new sources of particulate matter use latest control technology (such as enclosures, paving unpaved areas, parking lot sweeping and landscaping) and provide adequate buffer setbacks to protect existing or future sensitive receptors.

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, infants and children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors to the project site are the residents in the multi-family homes to the south of the site along Los Gamos Road. There are additional single- and multi-family homes to the south and southwest at further distances. This project would also introduce new sensitive receptors (residents).

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 that were used in this analysis are summarized in Table 1.

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 1,000-foot zone of influence)**	
Excess Cancer Risk	>10.0 per one million	>100 per one million	
Hazard Index	>1.0	>10.0	
Incremental annual $PM_{2.5}$	>0.3 µg/m^3	>0.8 µg/m^3	
Greenhouse Gas Emissions			
Land Use Projects – direct and indirect emissions	Compliance with a Qualified GHG Reduction Strategy OR 1,100 metric tons annually or 4.6 metric tons per capita (for 2020) *		

Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less. GHG = greenhouse gases.

*BAAQMD does not have a recommended post-2020 GHG threshold.

AIR QUALITY IMPACTS AND MITIGATION MEASURES

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

BAAQMD is the regional agency responsible for overseeing compliance with State and Federal laws, regulations, and programs within the San Francisco Bay Area Air Basin (SFBAAB). BAAQMD, with assistance from the Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC), prepares and implements specific plans to meet the applicable laws, regulations, and programs. The most recent and comprehensive of which is the *Bay Area 2017 Clean Air Plan*.[6] The primary goals of the Clean Air Plan are to attain air quality standards, reduce population exposure and protect public health, and reduce GHG emissions and protect the climate. The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality and GHG impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which, in turn, affects region-wide emissions of air pollutants and GHGs.

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

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

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

Construction Period Emissions

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 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 2017 (EMFAC2017) model was used to predict

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

emissions from construction traffic, which includes worker travel, vendor trucks, and haul trucks.[7] The CalEEMod model output along with construction inputs are included in *Attachment 2* and EMFAC2017 vehicle emissions modeling outputs are included in *Attachment 3*.

CalEEMod Inputs

Land Use Inputs

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

Table 1. Summary of Project Land Use Inputs

Project Land Uses	Size	Units	Square Feet (sf)	Acreage
Apartment Mid Rise[1]	192	Dwelling Units	251,828	5.05
Convenience Market (25 Hour)	4.323	1,000-sf	4,323	0.10
Parking Lot	53	Parking Spaces	21,200	0.48
Enclosed Paring with Elevator	171	Parking Spaces	68,400	1.54
Notes: Acreage based on CalEEMod defaults to account for building height and trenching. [1] Apartment Mid Rise square footage includes community center square footage.				

Construction Inputs

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

The CalEEMod defaults 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 based on CalEEMod defaults. 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 January 2021 and the project would be built out over a period of approximately 15 months, or 320 construction workdays. The first full year of operation was assumed to be 2023.

Construction Truck Traffic Emissions

The latest version of the CalEEMod model is based on the older version of the CARB EMFAC2014 motor vehicle emission factor model. This model has been superseded by the EMFAC2017 model; however, CalEEMod has not been updated to include EMFAC2017. 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

[7] See CARB's EMFAC2017 Web Database at https://www.arb.ca.gov/emfac/2017/

that were computed based on the estimate of 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. There was an estimated 1,000-cy of soil import and export. The number of concrete and asphalt total round haul trips were estimated based on the building and pavement square footages and converted to total one-way trips, assuming two trips per round-trip delivery.

The construction traffic information was combined with EMFAC2017 motor vehicle emissions factors. EMFAC2017 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 (demolition material export and soil import/export). Since CalEEMod does not address cement or asphalt trucks, these were treated as vendor travel distances. Each trip was assumed to include an idle time of 5 minutes. Emissions associated with vehicle starts were also included. On-road emission rates for years 2021-2022 for Marin County were used. Table 3 provides the traffic inputs that were combined with the EMFAC2017 emission factors to compute vehicle emissions.

Table 3. Construction Traffic Data Used for EMFAC2017 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]	67.6% LDA 7.4% LDT1 25.1% LDT2	50.3% MHDT 49.7% HHDT	100% HHDT	
Trip Length (miles)	10.8	7.3	20.0 (Demo/Soil) 7.3 (Cement/Asphalt)	CalEEMod default distance with 5-min truck idle time.
Demolition	300	-	-	CalEEMod default worker trips.
Site Preparation	180	-	-	CalEEMod default worker trips.
Grading	300	-	250	1,000-cy import and export. CalEEMod default worker trips.
Trenching	50	-	-	CalEEMod default worker trips.
Building Construction	40,940	8,280	729	Estimated.82,000-sf cement. CalEEMod default worker and vendor trips.
Architectural Coating	720	-	-	CalEEMod default worker trips.
Paving	300	-	138	Estimated.62,000-sf asphalt. CalEEMod default worker trips.

Notes: [1] Based on 2021-2022 EMFAC2017 light-duty vehicle fleet mix for Marin County.
[2] Includes grading trips estimated by CalEEMod based on amount of material to be removed.

Summary of Computed Construction Period Emissions

Annual emissions were predicted using CalEEMod and EMFAC2017, as described above. Average daily emissions were computed by dividing the total construction emissions by the number of construction days (320 construction workdays). Table 4 shows 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 construction period emissions would not exceed the BAAQMD significance thresholds.

Table 4. Construction Period Emissions

Year	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Total construction emissions (tons)	2.18 tons	3.28 tons	0.19 tons	0.16 tons
Average daily emissions (pounds)[1]	13.65 lbs./day	20.49 lbs./day	1.19 lbs./day	1.01 lbs./day
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 320 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. *Mitigation Measure AQ-1 would implement BAAQMD-recommended best management practices.*

Mitigation Measure AQ-1: **Include measures to control dust and exhaust during construction.**

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

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

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

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

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

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

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

8. Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Effectiveness of Mitigation Measure AQ-1

The measures above are consistent with BAAQMD-recommended basic control measures for reducing fugitive particulate matter that are contained in the BAAQMD CEQA Air Quality Guidelines.

Operational Period Emissions

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

CalEEMod Inputs

Land Uses

The project operational land uses were entered into CalEEMod as described above for the construction period modeling.

Model Year

Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CalEEMod. The earliest full year of operation

would be 2023 if construction begins in 2021. Emissions associated with build-out later than 2023 would be lower.

Trip Generation Rates

CalEEMod allows the user to enter specific vehicle trip generation rates. Therefore, the project-specific daily trip generation rate provided by the traffic consultant was entered into the model.[8] The project would produce 1,753 net daily trips after *an Internal Capture Reduction and a Pass-By Reduction*. The market trip percentage was adjusted to 100 percent primary trips in order to capture the traffic report's multiple reductions and not doubt count pass-by trips. The daily trip generation was calculated using the size of the project (i.e. dwelling units in the traffic trip generation rate table) and the adjusted total automobile trips. The Saturday and Sunday trip rates were adjusted by multiplying the ratio of the CalEEMod default rates for Saturday and Sunday trips to the default weekday rate with the project-specific daily weekday trip rate. Correspondence with the traffic engineer indicated the many customers that utilize the market would likely walk or take the short drive from the proposed adjacent residential neighborhood or nearby office uses. Therefore, the commercial-customer trip length for the market was adjusted to two miles to capture the short distance nearby customers would travel to utilize the market. The remaining trip lengths were default and default trip types specified by CalEEMod were used.

EMFAC2017 Adjustment

The vehicle emission factors and fleet mix used in CalEEMod are based on EMission FACtors from 2014 (EMFAC2014), which is an older CARB emission inventory for on road and off road mobile sources. Since the release of CalEEMod Version 2016.3.2, new emission factors have been produced by CARB. EMFAC2017 became available for use in March 2018 and approved by the EPA in August 2019. It includes the latest data on California's car and truck fleets and travel activity. Additionally, CARB has recently released EMFAC off-model adjustment factors to account for the Safer Affordable Efficient (SAFE) Vehicle Rule Part one.[9,10] The SAFE vehicle Rule Part One revoked California's authority to set its own GHG emission standards and set zero emission vehicle mandates in California. As a result of this ruling, mobile criteria pollutant and GHG emissions would increase. Therefore, the CalEEMod vehicle emission factors and fleet mix were updated with the emission rates and fleet mix from EMFAC2017, which were adjusted with the CARB EMFAC off-model adjustment factors. More details about the updates in emissions calculation methodologies and data are available in the EMFAC2017 Technical Support Document.[11]

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[8] W-Trans, Draft Traffic Impact Study for the Los Gamos Apartments Project, November 5, 2020.
[9] California Air Resource Board, 2019. *EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One*. November. Web: https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf
[10] California Air Resource Board, 2020. *EMFAC Off-Model Adjustment Factors for Carbon Dioxide (CO_20 Emissions to Accounts for the SAFE Vehicles Rule Part One and the Final SAFE Rule*. June. Web: https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf?utm_medium=email&utm_source=govdelivery
[11] See CARB 2018: https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-modeling-tools-emfac

Energy

CalEEMod defaults for energy use were used, which include the 2016 Title 24 Building Standards. Indirect emissions from electricity were computed in CalEEMod. The model has a default rate of 641.3 pounds of CO_2 per megawatt of electricity produced, which is based on PG&E's 2008 emissions rate. However, PG&E published in 2019 emissions rates for 2010 through 2017, which showed the emission rate for delivered electricity had been reduced to 210 pounds CO_2 per megawatt of electricity delivered in the year 2017.[12]

In addition, Marin Clean Energy (MCE) now provides electricity to 86 percent of Marin County, with 60 percent renewable and 100 percent being carbon free electricity by 2022. The 2017 CO_2 intensity rate provided by MCE was 109 pounds of CO_2 per megawatt of electricity delivered.[13] The CO_2 intensity rate input into CalEEMod was adjusted to account for 86 percent participation of MCE's rate and 14 percent of PG&E's rate. The computed rate is 123 pounds of CO_2 per megawatt of electricity delivered. This rate was used in the model.

Other Inputs

Default model assumptions for emissions associated with solid waste generation use were applied to the project. Water/wastewater use were changed to 100% aerobic conditions to represent wastewater treatment plant conditions. All hearths were assumed to be powered by natural gas per BAAQMD Regulation 6, Rule 3, which requires that new building construction not install a wood-burning device (effective as of November 1, 2016).[14]

Existing Uses

The project would be built on a parcel that is vacant. Therefore, existing land use emissions would not exist, nor used to offset proposed project conditions.

Summary of Computed Operational Period Emissions

Annual emissions were predicted using CalEEMod and daily emissions were estimating assuming 365 days of operation. Table 5 shows average daily emissions of ROG, NO_X, total PM_{10}, and total $PM_{2.5}$ during operation of the project. The operational period emissions would not exceed the BAAQMD significance thresholds.

[12] PG&E, 2019. *Corporate Responsibility and Sustainability Report*. Web: http://www.pgecorp.com/corp_responsibility/reports/2019/assets/PGE_CRSR_2019.pdf
[13] Correspondence with Rebecca Boyles, Marin Clean Energy, August 2, 2019.
[14] Bay Area Air Quality Management District,

Table 5. Operational Period Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
2028 Project Operational Emissions (*tons/year*)	2.23 tons	0.91 tons	1.19 tons	0.33 tons
BAAQMD Thresholds (tons /year)	*10 tons*	*10 tons*	*15 tons*	*10 tons*
Exceed Thresholds?	No	No	No	No
2028 Project Operational Emissions (*lbs./day*)[1]	12.21 lbs.	4.99 lbs.	6.52 lbs.	1.83 lbs.
BAAQMD Thresholds (lbs./day)	*54 lbs.*	*54 lbs.*	*82 lbs.*	*54 lbs.*
Exceed Threshold?	No	No	No	No

Notes: [1] Assumes 365-day operation.

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

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

Project construction activity would generate dust and equipment exhaust that would affect nearby sensitive receptors. The project would not include the installation of any emergency generators powered by a diesel engine, which would produce TAC and air pollutant emissions. The project would generate some traffic, consisting of light-duty vehicles. However, the number of net daily trips generated by the project are small (i.e. 1,753 daily trips)[15] and emissions from automobile traffic generated by the project would be spread out over a broad geographical area and not localized. Project traffic was not be considered a source of substantial TACs or $PM_{2.5}$.

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

Community Risk Methodology for Construction and Operation

Community risk impacts were addressed by predicting increased cancer risk, the increase in annual $PM_{2.5}$ concentrations and computing the Hazard Index (HI) for non-cancer health risks. The risk impacts from the project are the combination of risks from construction and operation sources. These sources include on-site construction activity, construction truck hauling, and increased traffic from the project. To evaluate the increased cancer risks from the project, a 30-year exposure period was used, per BAAQMD guidance,[16] with the sensitive receptors being exposed to both project construction and operation emissions during this timeframe.

[15] W-Trans, Draft Traffic Impact Study for the Los Gamos Apartments Project, November 5, 2020.
[16] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines.* December 2016.

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

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

Modeled Sensitive Receptors

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

Community Health Risk from Project Construction

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust air pollutant emissions would not be considered to contribute substantially to existing or projected air quality violations. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issue associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. A health risk assessment of the project construction activities was conducted that evaluated potential health effects to nearby sensitive receptors from construction emissions of DPM and $PM_{2.5}$.[17] This assessment included dispersion modeling to predict the offsite and onsite concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated.

Construction Emissions

The CalEEMod model and EMFAC2017 calculations 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 0.1578 tons (316 pounds). The on-road emissions are a result of haul truck travel during demolition and 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 and EMFAC2017 as 0.0860 tons (172 pounds) for the overall construction period.

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

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at sensitive receptors (residences) in the vicinity of the project construction area. The AERMOD dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.[18]

To represent the construction equipment exhaust emissions, an area source emission release height of 20 feet (6 meters) was used for the area sources.[19] The release height incorporates both the physical release height from the construction equipment (i.e., the height of the exhaust pipe) and plume rise after it leaves the exhaust pipe. Plume rise is due to both the high temperature of the exhaust and the high velocity of the exhaust gas. It should be noted that when modeling an area source, plume rise is not calculated by the AERMOD dispersion model as it would do for a point source (exhaust stack). Therefore, the release height from an area source used to represent emissions from sources with plume rise, such as construction equipment, should be based on the height the exhaust plume is expected to achieve, not just the height of the top of the exhaust pipe.

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.

The modeling used a five-year data set (2013-2017) of hourly meteorological data from the Gnoss Field Airport in Novato that was prepared for use with the AERMOD model by BAAQMD. Construction emissions were modeled as occurring Monday through Friday between 7:00 a.m. to 4:00 p.m., when the majority of construction activity would occur. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2023-2027 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors.

Receptor elevations were based on USGS National Elevation Data (NED) with a 10-meter resolution. 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 floors of nearby single- and multi-family residences and apartments.[20]

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

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

[20] 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

Summary of Construction Community Risk Impacts

The increased cancer risk calculations were based on applying the BAAQMD recommended age sensitivity factors to the TAC concentrations, as described in *Attachment 1*. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing TACs. Infant and adult exposures were assumed to occur at all residences during the entire construction period.

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

The maximum modeled annual DPM and $PM_{2.5}$ concentrations, which include both the DPM and fugitive $PM_{2.5}$ concentrations, were identified at nearby sensitive receptors to find the MEI. Results of this assessment indicated that the MEI most affected by construction was located on the second floor (15 feet above ground) of the closest multi-family residence to the south of the project site. The location of the MEI is shown in Figure 1.

Table 6 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities. The maximum increased cancer risks, maximum $PM_{2.5}$ concentration, and health hazard indexes from construction at the MEI do not exceed their respective BAAQMD single-source thresholds of greater than 10.0 per million for cancer risk, greater than 0.3 $\mu g/m^3$ for $PM_{2.5}$ concentration and greater than 1.0 for HI. *Attachment 4* to this report includes the emission calculations used for the construction modeling and the cancer risk calculations.

Table 6. Construction Risk Impacts at the Off-Site MEI Receptor

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Construction	Unmitigated	2.9 (infant)	0.02	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*

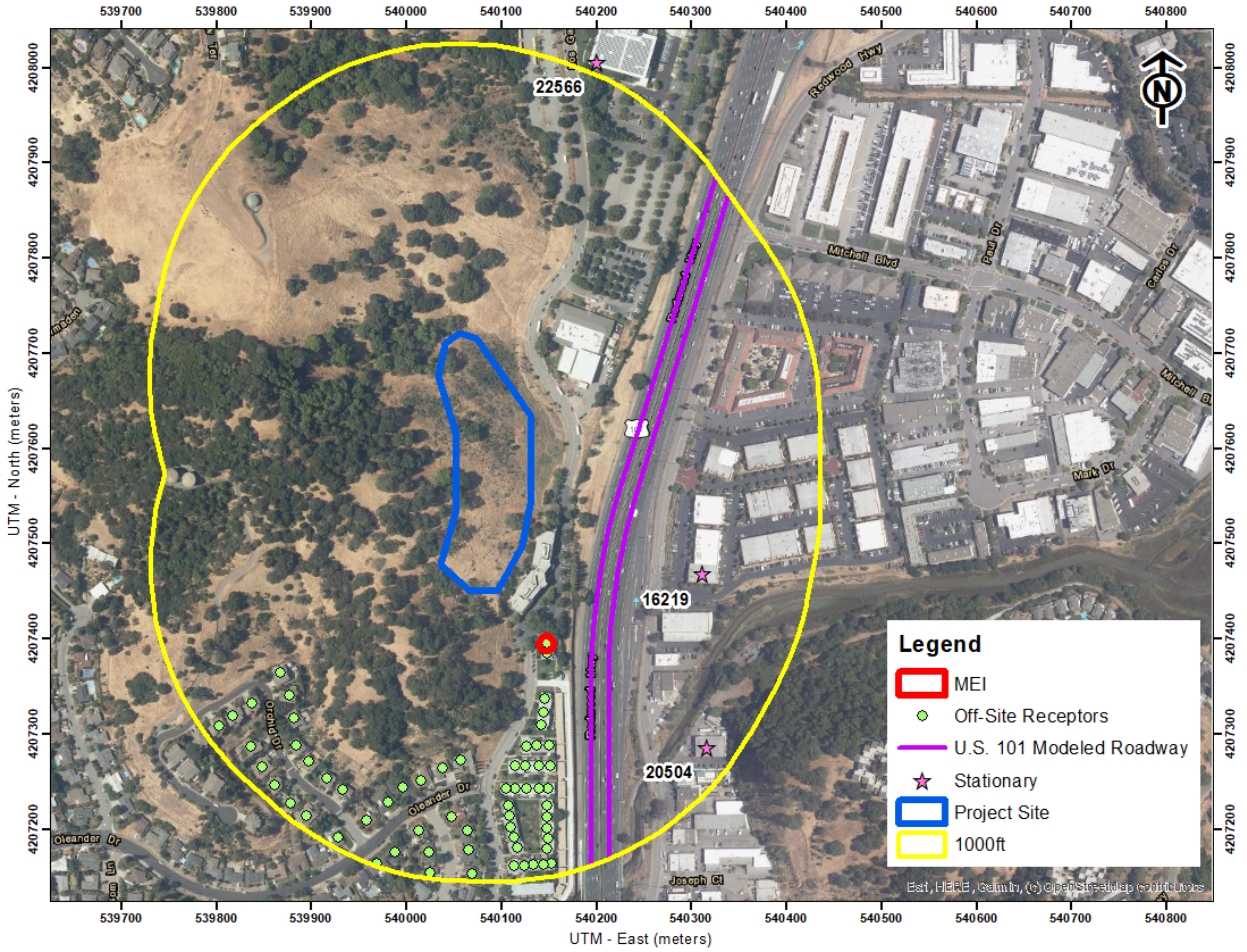
Figure 1. Project Construction Site, Locations of Off-Site Sensitive Receptors, and Maximum TAC Impact Location (MEI)

Combined Impact of All TAC Sources on the Off-Site Construction MEIs

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 the project site (i.e. influence area). These sources include rail lines, freeways or highways, busy surface streets, and stationary sources identified by BAAQMD. A review of the project area indicates that traffic on U.S. Highway 101 (U.S. 101) has an average daily traffic (ADT) of over 10,000 vehicles. All other roadways within the area are assumed to have an ADT that is less than 10,000 vehicles. Three stationary sources were identified within the 1,000-foot influence area using the BAAQMD's stationary source geographic information systems (GIS) map tool.[21] Figure 2 shows the sources affecting the project site and MEI. Community risk impacts from these sources upon the MEI are reported in Table 7. Details of the modeling and community risk calculations are included in *Attachment 5*.

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

Figure 2. Project Site, MEI Location, and Nearby TAC Sources



Highways – U.S. Highway 101

The project site and construction MEI are located near U.S. 101. A refined analysis of the impacts of TACs and $PM_{2.5}$ to the project site and MEI receptors are necessary to evaluate potential cancer risks and $PM_{2.5}$ concentrations from U.S. 101. A review of the traffic information reported by the California Department of Transportation (Caltrans) indicates that in 2018 U.S. 101 traffic had 191,100 vehicles per day (based on an annual average) with about 4.4 percent trucks, of which 2.0 percent are considered diesel heavy duty trucks and 2.4 percent are medium duty trucks.[22]

Traffic Emissions Modeling

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for traffic on U.S. 101 using the Caltrans version of the CARB EMFAC2017 emissions model, known as CT-EMFAC2017. CT-EMFAC2017 provides emission factors for mobile source criteria pollutants and TACs, including DPM. Emission processes modeled include running exhaust for DPM, $PM_{2.5}$ and total organic compounds (TOG), running evaporative losses for TOG, and tire

[22] Caltrans. 2020. *2018 Annual Average Daily Truck Traffic on the California State Highway System.* Web: https://dot.ca.gov/programs/traffic-operations/census

and brake wear and fugitive road dust for $PM_{2.5}$. DPM emissions are projected to decrease in the future and are reflected in the CT-EMFAC2017 emissions data. Inputs to the model include region (i.e., Marin County), type of road, traffic mix assigned by CT-EMFAC2017 for the county and adjusted for the local truck mix on U.S. 101, year of analysis, and season.

In order to estimate TAC and $PM_{2.5}$ emissions over the 30-year exposure period used for calculating increased cancer risks to the MEI from traffic on U.S. 101, the CT-EMFAC2017 model was used to develop vehicle emission factors for the year 2021 (project construction start year) using the calculated mix of cars and trucks on U.S. 101. Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CT-EMFAC2017. Year 2021 emissions were conservatively assumed as being representative of future conditions over the time period that cancer risks are evaluated (30 years), since, as discussed above, overall vehicle emissions, and in particular diesel truck emissions will decrease in the future. Average daily traffic volumes and truck percentages were based on Caltrans data for U.S. 101. Traffic volumes were assumed to increase 1 percent per year. Average hourly traffic distributions for Marin County roadways were developed using the EMFAC model,[23] which were then applied to the average daily traffic volumes to obtain estimated hourly traffic volumes and emissions for U.S. 101.

For all hours of the day, other than during peak a.m. and p.m. periods, an average speed of 65 mph was assumed for all vehicles on U.S. 101. For 2-hours during the southbound peak a.m. period and the 2-hours during the northbound peak p.m. period, an average travel speed of 30 mph was assumed.

This analysis involved the development of DPM, organic TACs, and $PM_{2.5}$ emissions for future traffic on U.S. 101and using these emissions with an air quality dispersion model to calculate TAC and $PM_{2.5}$ concentrations at the project construction MEI receptor location. Maximum increased cancer risks and annual $PM_{2.5}$ concentrations for the receptors were then computed using modeled TAC and $PM_{2.5}$ concentrations and BAAQMD methods and exposure parameters described in *Attachment 1*.

Dispersion Modeling

Dispersion modeling of TAC and $PM_{2.5}$ emissions was conducted using the U.S. EPA AERMOD dispersion model, which is recommended by the BAAQMD for this type of analysis. Northbound and southbound traffic on U.S. 101within about 1,000 feet of the project site was evaluated with the model. Emissions from vehicle traffic were modeled in AERMOD using a series of volume sources along a line (line-volume sources), with line segments used to represent northbound and southbound travel lanes on U.S. 101. The modeling used a five-year data set (2013-2017) of hourly meteorological data from Gnoss Field Airport in Novato prepared by the BAAQMD for use with the AERMOD model. Other inputs to the model included road geometry and elevations, hourly

[23] The Burden output from EMFAC2007, CARB's previous version of the EMFAC model, was used for this since the current web-based version of EMFAC2017 does not include Burden type output with hour by hour traffic volume information.

traffic emissions, and receptor location, elevations, and heights. Roadway and receptor elevations were based on USGS National Elevation Data (NED) with a 10-meter resolution.

Computed Cancer and Non-Cancer Health Impacts

The cancer risk, $PM_{2.5}$ concentration, and HI impacts from U.S. 101 on the construction MEI are shown in Table 7. Figure 1 shows the roadway links used for the modeling and MEI locations where concentrations were calculated. Details of the U.S. 101 traffic emission calculations, dispersion modeling and cancer risk calculations for the construction MEI are provided in *Attachment 5*.

BAAQMD Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Permitted Stationary Sources 2018* GIS website.[24] This mapping tool identifies the location of nearby stationary sources and their estimated risk and hazard impacts. Three sources were identified using this tool with one source being a sub-slab generic equipment, one a generator, and one a generator and boiler. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. BAAQMD provided input and clarification about the stationary sources.[25]

The screening average daily emissions for all the sources were adjusted for distance using BAAQMD's *Distance Adjustment Multiplier Tool for Diesel Internal Combustion Engines and Generic Distance Multiplier Tool*. Note that no age-sensitivity factors were included in the screening analysis, so risks would be similar or lower if adjustments were included. Community risk impacts from the stationary sources upon the MEIs are reported in Table 7.

Summary of Cumulative Risks at Off-site Construction MEIs

Table 7 reports both the project and cumulative community risk impacts at the sensitive receptors most affected by construction (i.e. the MEI). The project's community risk from project construction activities would not exceed the maximum increased cancer risk, maximum $PM_{2.5}$ concentration, or HI single-source thresholds.

[24] BAAQMD, Web: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=2387ae674013413f987b1071715daa65
[25] Correspondence with Areana Flores, MSc, Environmental Planner, BAAQMD, September 29, 2020.

Table 7. Cumulative Community Risk Impacts from Combined TAC Sources at MEI

Source		Cancer Risk* (per million)	Annual $PM_{2.5}$* ($\mu g/m^3$)	Hazard Index
Project Impacts				
Project Construction	Unmitigated	2.9 (infant)	0.02	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
Cumulative Sources				
U.S. Highway 101		43.0	**0.82**	0.01
Fairchild Semiconductor Corp c/o Weiss Associates (Facility ID #16219, Generic Equipment), MEI 530 feet		<0.1	--	--
Las Gallinas Valley Sanitary District (Facility ID #20504, Generator), MEI 570 feet		0.3	--	--
County of Marin c/o Sares Regis (Facility ID #00266, Generator), MEI 1,000 feet		4.6	0.02	0.01
Combined Sources	*Unmitigated*	50.9 (infant)	**0.86**	<0.03
BAAQMD Cumulative Source Threshold		***>100***	***>0.8***	***>10.0***
Exceed Threshold?	Unmitigated	*No*	***Yes***	*No*

The cumulative $PM_{2.5}$ concentration exceeds the threshold from existing sources alone. Cumulative risks exceed the $PM_{2.5}$ concentration threshold because of the overwhelming influence of the traffic on the nearby highway (U.S. 101) at the MEI. Even with the best available construction mitigation measures, since the project's unmitigated $PM_{2.5}$ concentration only represents 2 percent of the total mitigated cumulative risk, the incorporation of construction mitigation measures would not make a measurable difference in reducing the cumulative $PM_{2.5}$ concentration and it would still exceed the cumulative threshold. Therefore, the project construction activities would not substantially contribute to the total cumulative $PM_{2.5}$ concentration and the impact would not be cumulatively considerable.

Non-CEQA: On-site Community Risk Assessment for TAC Sources - New Project Residences

In addition to evaluating health impact from project construction, a health risk assessment was completed to assess the impact that existing TAC sources would have on the new proposed sensitive receptors (senior residents) that the project would introduce. The same TAC sources identified above were used in this health risk assessment.[26]

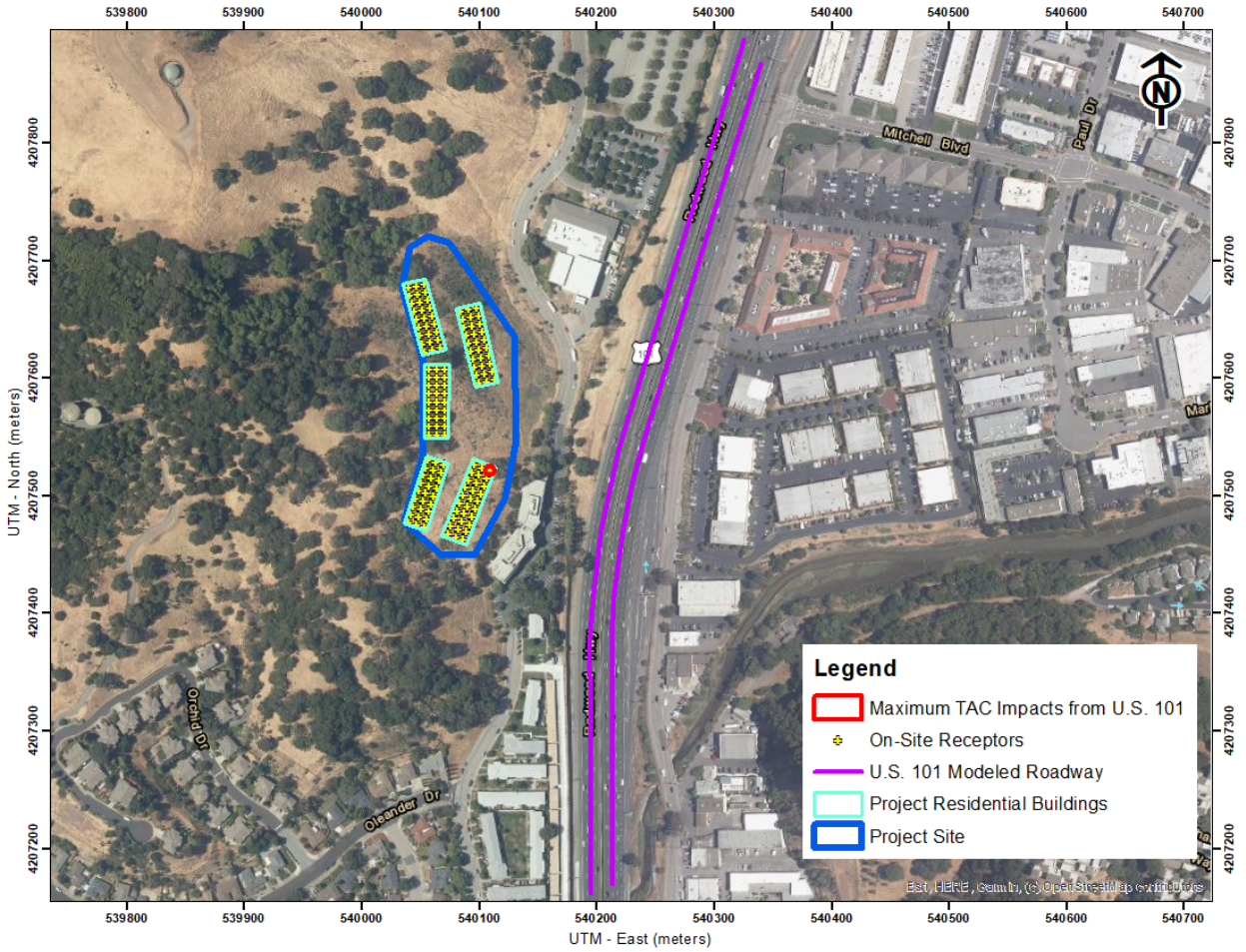
Highways – U.S. Highway 101

The highway analysis for the new project sensitive receptors was conducted in the same manner as described above for the construction MEI. The project set of receptors placed within the project residential area are spaced every 23 feet (7 meters). Project residential units in the new buildings would be located on all floor levels. Highway impacts were modeled at receptor heights of 5 feet (1.5 meters) and 20 feet (6 meters) representing sensitive receptors on the first and second floors. Project sensitive receptors higher than the second floor would have highway impacts less than those on the second floor. The closest project site residential building is about 300 feet west from U.S. 101. Figure 3 shows the roadway links and on-site receptor locations used in the modeling. Risk values were computed using modeled DPM and $PM_{2.5}$ concentrations and BAAQMD recommended methods and exposure parameters described in *Attachment 1*. Details of the emission calculations, dispersion modeling and cancer risk calculations are contained in *Attachment 5.*

The maximum impacts occurred at a receptor height of 5 feet (first floor level) at the residential units closest to U.S. 101. The location of maximum cancer risks is shown in Figure 3. Increased cancer risks at residences on floor levels above the second floor would be less than the maximum cancer risk on the second-floor level. Cancer risks associated with U.S. 101 are greatest closest to US. 101 and decrease with distance from the highway. The risk impacts from the highway on the project receptors are provided in Table 8.

[26] We note that to the extent this analysis considers *existing* air quality issues in relation to the impact on *future residents* of the Project, it does so for informational purposes only pursuant to the judicial decisions in *CBIA v. BAAQMD* (2015) 62 Cal.4th 369, 386 and *Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201 Cal.App.4th 455, 473, which confirm that the impacts of the environment on a project are excluded from CEQA unless the project itself "exacerbates" such impacts.

Figure 3. Project Site and On-Site Residential Receptors, U.S. 101 Segments Evaluated, and Location of Maximum TAC Impacts



Stationary Sources

The stationary source screening analysis for the new project sensitive receptors was conducted in the same manner as described above for the construction MEI. Table 8 shows the risk impacts from the stationary sources on the project receptors.

Cumulative Community Health Risk at Project Site

Community risk impacts from the combined sources upon the project site are reported in Table 8. The TAC sources are compared against the BAAQMD single-source threshold and then combined and compared against the BAAQMD cumulative-source threshold. As shown, the HI from the nearby sources does not exceed their single-source or cumulative-source thresholds. However, cancer risk and annual $PM_{2.5}$ concentrations are estimated to exceed the single-source threshold, but not the cumulative-source threshold, due to emissions from U.S. 101.

Table 8. Impacts from Combined Sources to Project Site Receptors

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
U.S. Highway 101	**16.8**	**0.32**	<0.01
Fairchild Semiconductor Corp c/o Weiss Associates (Facility ID #16219, Generic Equipment), Project Site 625 feet	<0.1	--	--
Las Gallinas Valley Sanitary District (Facility ID #20504, Generator), Project Site 880 feet	0.2	--	--
County of Marin c/o Sares Regis (Facility ID #00266, Generator), Project Site 1,000 feet	4.6	0.02	0.01
BAAQMD Single-Source Threshold	***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	***Yes***	***Yes***	*No*
Cumulative Total	18.7	0.34	<0.02
BAAQMD Cumulative Source Threshold	***>100***	***>0.8***	***>10.0***
Exceed Threshold?	*No*	*No*	*No*

Recommended Design Features to Reduce Project Receptor Exposure

Filtration in ventilation systems at the project site would be recommended to reduce the level of harmful pollutants to below the significant thresholds. The significant exposure for new project receptors is judged by two effects: (1) increased cancer risk, and (2) annual $PM_{2.5}$ concentration. Exposure to cancer risk and annual $PM_{2.5}$ concentrations from U.S. 101 traffic are above their respective thresholds. Cancer risk is mostly the result of exposure to diesel particulate matter, although, gasoline vehicle exhaust contributes to this effect. Annual $PM_{2.5}$ concentrations are based on the exposure to $PM_{2.5}$ resulting from emissions attributable to truck and auto exhaust, the wearing of brakes and tires and re-entrainment of roadway dust from vehicles traveling over pavement. The modeled $PM_{2.5}$ exposure to future residents drives the mitigation plan. Reducing particulate matter exposure would reduce both annual $PM_{2.5}$ exposures and cancer risk.

The project shall include the following measures to minimize long-term increased cancer risk and annual $PM_{2.5}$ exposure for new project occupants:

1. Install air filtration in all of the residential buildings on the project site. Air filtration devices shall be rated MERV13 or higher. To ensure adequate health protection to sensitive receptors (i.e., residents), this ventilation system, whether mechanical or passive, shall filter all fresh air that would be circulated into the dwelling units.

2. The ventilation system shall be designed to keep the building at positive pressure when doors and windows are closed to reduce the intrusion of unfiltered outside air into the building

3. As part of implementing this measure, an ongoing maintenance plan for the buildings' heating, ventilation, and air conditioning (HVAC) air filtration system shall be required.

4. Ensure that the use agreement and other property documents: (1) require cleaning, maintenance, and monitoring of the affected buildings for air flow leaks, (2) include assurance that new owners or tenants are provided information on the ventilation system, and (3) include provisions that fees associated with owning or leasing a unit(s) in the

building include funds for cleaning, maintenance, monitoring, and replacements of the filters, as needed.

Effectiveness of Recommended Design Features

A properly installed and operated ventilation system with MERV13 would achieve an 80-percent reduction.[27] The overall effectiveness calculations take into account the amount of time spent outdoors and away from home. Assuming that the filtration system is 80-percent effective and the individual is being exposed to 21 hours of indoor filtered air and three hours of outdoor unfiltered air, then the overall effectiveness of a MERV13 filtration system would be about 70-percent for $PM_{2.5}$ exposure. This would reduce the maximum cancer risk from U.S. 101 to 5.0 in one million and annual $PM_{2.5}$ concentration from U.S. 101 to 0.10 $\mu g/m^3$. With this recommended design feature, impacts from U.S. 101 are below their respective single-source thresholds.

Impact AIR-4: Create objectionable odors affecting a substantial number of people?

The project would generate localized emissions of diesel exhaust during construction equipment operation and truck activity. These emissions may be noticeable from time to time by adjacent receptors. However, they would be localized and are not likely to adversely affect people off-site by resulting in confirmed odor complaints. The project would not include any sources of significant odors that would cause complaints from surrounding uses.

[27] Bay Area Air Quality Management District (2016). Appendix B: Best Practices to Reduce Exposure to Local Air Pollution, *Planning Healthy Places A Guidebook for Addressing Local Sources of Air Pollutants in Community Planning* (p. 38). http://www.baaqmd.gov/~/media/files/planning-and-research/planning-healthy-places/php_may20_2016-pdf.pdf?la=en

Greenhouse Gas Emissions

Setting

Gases that trap heat in the atmosphere, GHGs, regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO_2) and water vapor but there are also several others, most importantly methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

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

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

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

Recent Regulatory Actions for California GHG Emissions

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

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

Assembly Bill 32 (AB 32), California Global Warming Solutions Act (2006)

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

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

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

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

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

SB 32 was passed in 2016, which codified a 2030 GHG emissions reduction target of 40 percent below 1990 levels. CARB is currently working on a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The proposed Scoping Plan Update was published on January 20, 2017 as directed by SB 32 companion legislation AB 197. The mid-term 2030 target is considered critical by CARB on the path to obtaining an even deeper GHG emissions target of 80 percent below 1990 levels by 2050, as directed in Executive Order S-3-05. The Scoping Plan outlines the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure, providing a blueprint to continue driving down GHG emissions and obtain the statewide goals.

The new Scoping Plan establishes a strategy that will reduce GHG emissions in California to meet the 2030 target (note that the AB 32 Scoping Plan only addressed 2020 targets and a long-term goal). Key features of this plan are:

- Cap and Trade program places a firm limit on 80 percent of the State's emissions;
- Achieving a 50-percent Renewable Portfolio Standard by 2030 (currently at about 29 percent statewide);
- Increase energy efficiency in existing buildings;
- Develop fuels with an 18-percent reduction in carbon intensity;
- Develop more high-density, transit-oriented housing;
- Develop walkable and bikeable communities;
- Increase the number of electric vehicles on the road and reduce oil demand in half;
- Increase zero-emissions transit so that 100 percent of new buses are zero emissions;
- Reduce freight-related emissions by transitioning to zero emissions where feasible and near-zero emissions with renewable fuels everywhere else; and
- Reduce "super pollutants" by reducing methane and HFCs by 40 percent.

In the updated Scoping Plan, CARB recommends statewide targets of no more than 6 metric tons CO_2e per capita (statewide) by 2030 and no more than 2 metric tons CO_2e per capita by 2050. The statewide per capita targets account for all emissions sectors, statewide population forecasts, and the statewide reductions necessary to achieve the 2030 statewide target under SB 32 and the longer-term State emissions reduction goal of 80 percent below 1990 levels by 2050.

Executive Order B-55-18 – Carbon Neutrality

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

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

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

reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

SB 350 Renewable Portfolio Standards

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

Senate Bill 100 – Current Renewable Portfolio Standards

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

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

The California Green Building Standards Code (CALGreen Code) is part of the California Building Standards Code under Title 24, Part 11.[28] The CALGreen Code encourages sustainable construction standards that involve planning/design, energy efficiency, water efficiency resource efficiency, and environmental quality. These green building standard codes are mandatory statewide and are applicable to residential and non-residential developments. The most recent CALGreen Code (2019 California Building Standard Code) was effective as of January 1, 2020.

The California Building Energy Efficiency Standards (California Energy Code) is under Title 24, Part 6 and is overseen by the California Energy Commission (CEC). This code includes design requirements to conserve energy in new residential and non-residential developments, while being cost effective for homeowners. This Energy Code is enforced and verified by cities during the planning and building permit process. The current energy efficiency standards (2019 Energy Code) replaced the 2016 Energy Code as of January 1,2020. Under the 2019 standards, single-family homes are predicted to be 53 percent more efficient than homes built under the 2016 standard due more stringent energy-efficiency standards and mandatory installation of solar photovoltaic systems. For nonresidential developments, it is predicted that these buildings will use 30 percent less energy due to lightening upgrades.[29]

[28] See: https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen#:~:text=CALGreen%20is%20the%20first%2Din,to%201990%20levels%20by%202020.
[29] See: https://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Building_Standards_FAQ_ada.pdf

Federal and Statewide GHG Emissions

The U.S. EPA reported that in 2018, total gross nationwide GHG emissions were 6,676.6 million metric tons (MMT) carbon dioxide equivalent (CO_2e).[30] These emissions were lower than peak levels of 7,416 MMT that were emitted in 2007. CARB updates the statewide GHG emission inventory on an annual basis where the latest inventory includes 2000 through 2017 emissions.[31] In 2017, GHG emissions from statewide emitting activities were 424 MMT. The 2017 emissions have decreased by 14 percent since peak levels in 2004 and are 7 MMT below the 1990 emissions level and the State's 2020 GHG limit. Per capita GHG emissions in California have dropped from a 2001 peak of 14.1 MT per person to 10.7 MT per person in 2017. The most recent Bay Area emission inventory was computed for the year 2011.[32] The Bay Area GHG emission were 87 MMT. As a point of comparison, statewide emissions were about 444 MMT in 2011

San Rafael Climate Change Action Plan 2030

The City of San Rafael has a Climate Change Action Plan, adopted in May 2019,[33] that established the goal and measures to reduce greenhouse gas emissions 19% below 1990 levels by 2020 (equivalent to 31% below 2005 levels), and 42% below 1990 levels by 2030, which is enough to surpass the City and State goals for those years. However, the Plan does not have a specific metric ton GHG threshold for project-level construction or operation. Therefore, the BAAQMD's CEQA Air Quality Guideline's thresholds are used.

BAAQMD Significance Thresholds

The BAAQMD's CEQA Air Quality Guidelines do not use quantified thresholds for projects that are in a jurisdiction with a qualified GHG reductions plan (i.e., a Climate Action Plan). The plan has to address emissions associated with the period that the project would operate (e.g., beyond year 2020). For quantified emissions, the guidelines recommended a GHG threshold of 1,100 metric tons or 4.6 metric tons (MT) per capita. These thresholds were developed based on meeting the 2020 GHG targets set in the scoping plan that addressed AB 32. Development of the project would occur beyond 2020, so a threshold that addresses a future target is appropriate.

Although BAAQMD has not published a quantified threshold for 2030 yet, this assessment uses a "Substantial Progress" efficiency metric of 2.8 MT CO_2e/year/service population and a bright-line threshold of 660 MT CO_2e/year based on the GHG reduction goals of EO B-30-15. The service population metric of 2.8 is calculated for 2030 based on the 1990 inventory and the projected 2030

[30] United States Environmental Protection Agency, 2020. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2018*. April. Web: https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf.
[31] CARB. 2019. *2019 Edition, California Greenhouse Gas Emission Inventory: 2000 – 2017*. Web: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf.
[32] BAAQMD. 2015. *Bay Area Emissions Inventory Summary Report: Greenhouse Gases Base Year 2011*. January. Web: http://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/by2011_ghgsummary.pdf.
[33] City of San Rafael, *San Rafael Climate Change Action Plan 2030*, April 2019. Web: https://storage.googleapis.com/proudcity/sanrafaelca/uploads/2019/06/Att-D-CCAP-2030-Final-Draft-4-23-19.pdf.

statewide population and employment levels.[34] The 2030 bright-line threshold is a 40 percent reduction of the 2020 1,100 MT CO_{2e}/year threshold. Evidence published by the State indicates the AB 32 goal of reducing statewide GHG emissions to 1990 levels was met prior to 2020. Current State plans are to further reduce emissions to 40% below 1990 levels by 2030. Assuming statewide emissions are at 1990 levels or lower in 2020, it would be logical to reduce the BAAQMD-recommended threshold for meeting the AB 32 threshold by 40% to develop a threshold for 2030.

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

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

CalEEMod Modeling

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

Service Population Emissions

The project service population efficiency rate is based on the number of future residents and employees. For this project, the number of future residents was estimated by multiplying the total number of units (e.g. 192 units) by the persons per household rate for the City of San Rafael found in the California Department of Finance Population and Housing Estimate report.[35] Using the 2.49 person per household 2019 rate, the number of futures residents was estimated to be 478 residents. According to the project applicant, there would be three future employees working at the proposed market. The estimated total service population was 481 and this was used to calculate the per capita emissions.

Construction Emissions

GHG emissions associated with construction were computed to be 617 MT of CO_2e for the total construction period. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the City nor BAAQMD have an adopted threshold of significance for construction-related GHG emissions, though BAAQMD recommends

[34] Bay Area Air Quality Management District, 2016. *CLE International 12th Annual Super-Conference CEQA Guidelines, Case Law and Policy Update*. December.
[35] State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties, and the State, 2010-2019*. Sacramento, California. Available at: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/.

quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable.

Operational Emissions

The CalEEMod model, along with the project vehicle trip generation rates, was used to estimate daily emissions associated with operation of the fully developed site under the proposed project. As shown in Table 9, the annual emissions resulting from operation of the proposed project are predicted to be 1,322 MT of CO_2e in 2023 and 1,178 MT of CO_2e in 2030. The service population emission for the year 2023 and 2030 are predicted to be 2.7 and 2.5 MT/CO_2e/year/service population, respectively.

To be considered an exceedance, the project must exceed both the GHG significance threshold in metric tons per year and the service population significance threshold in the future year of 2030. The project would exceed the annual emissions bright-line threshold of 660 MT CO_2e/year in 2030 but would not exceed the per service population threshold of 2.8 MT of CO_2e/year/service population in 2030. Therefore, the project would not be in exceedance for GHG emissions.

Table 9. Annual Project GHG Emissions (CO_2e) in Metric Tons and Per Capita

Source Category	Proposed Project in 2023	Proposed Project in 2030
Area	10	10
Energy Consumption	163	163
Mobile	1,085	941
Solid Waste Generation	51	51
Water Usage	13	13
Total (MT CO_2e/year)	1,322	**1,178**
Significance Threshold		***660 MT CO_2e/year***
Service Population Emissions (MT CO_2e/year/service population)	2.7	2.5
Significance Threshold		***2.8 in 2030***
Exceeds both thresholds?		*No*

Impact GHG-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The proposed project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB's Scoping Plan nor would the project conflict with SB 100 goals. For example, proposed buildings would be constructed in conformance with CALGreen and the Title 24 Building Code, which requires high-efficiency water fixtures, water-efficient irrigation systems, and compliance with current energy efficacy standards.

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 and operational criteria air pollutant and GHG emissions. The operational outputs for 2030 uses are also included in this attachment. Also included are any modeling assumptions.

Attachment 3 includes the EMFAC2017 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. AERMOD dispersion modeling files for these assessments, which are quite voluminous, are available upon request and would be provided in digital format.

Attachment 5 includes the cumulative community risk calculations, modeling results, and health risk calculations from sources affecting the construction MEI and on-site sensitive 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.[36] 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.[37] 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.[38] 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

[36] 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.
[37] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[38] 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

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

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

Parameter	*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*

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

peak hours, respectively. As no pass-by rates for daily trips were available, the lower weekday p.m. peak hour pass-by rate of 51 percent was applied to daily trips.

Total Project Trip Generation

Based on application of these rates, the proposed project is expected to generate an average of 4,339 trips per day, including 339 a.m. peak hour trips and 296 trips during the p.m. peak hour. After deductions are made to reflect pass-by and internal trips, the project would be expected to generate 1,753 net new trips daily, with 80 trips occurring during the a.m. peak hour and 95 trips during the p.m. peak hour. Taken individually, the proposed residences would be expected to generate an average of 1,044 trips daily, with 69 of these occurring during the morning peak hour and 84 during the evening peak hour. These results are summarized in Table 7.

Table 7 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Multifamily Housing	192 du	5.44	1044	0.36	69	18	51	0.44	84	52	32
Convenience Market	4.323 ksf	762.28	3,295	62.54	270	135	135	49.11	212	108	104
Subtotal			***4,339***		***339***	***153***	***186***		***296***	***160***	***136***
Internal Capture		*-20.9%*	*-906*	*-10.3%*	*-35*	*-16*	*-19*	*-31.4%*	*-93*	*-48*	*-45*
Pass-By		*-51%*	*-1,680*	*-83%*	*-224*	*-112*	*-112*	*-51%*	*-108*	*-55*	*-53*
Total			**1,753**		**80**	**25**	**55**		**95**	**57**	**38**

Note: ksf = 1,000 square feet; du = dwelling unit

Trip Distribution

The pattern used to allocate new project trips to the street network was determined by reviewing Census data and assuming it would apply to employment patterns for the site's residents. The distribution assumptions are shown in Table 8.

Table 8 – Trip Distribution Assumptions

Route	Percent
To/from US 101 south of Lucas Valley Rd	58
To/from US 101 north of Lucas Valley Rd	36
To/from Las Gallinas Ave north of Lucas Valley Rd	3
To/from Las Gallinas Ave south of Lucas Valley Rd	3
TOTAL	**100**

Vehicle Miles Traveled (VMT)

Senate Bill (SB) 743 established a change in the metric to be applied for determining traffic impacts associated with development projects. Rather than the delay-based criteria associated with a Level of

Los Gamos Neighborhood, San Rafael - Marin County, Annual

Los Gamos Neighborhood, San Rafael

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	171.00	Space	1.54	68,400.00	0
Parking Lot	53.00	Space	0.48	21,200.00	0
Apartments Mid Rise	192.00	Dwelling Unit	5.05	251,828.00	549
Convenience Market (24 Hour)	4.32	1000sqft	0.10	4,323.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	123	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - MCE 2017 Rate = 109, PG&E 2017 rate = 210, (109*0.86)+(210*0.14) = 123

Land Use - Provided land uses - traffic and statistics sheet

Construction Phase - Default construction, trenching added

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Default construciton

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - trenching added

Trips and VMT - EMFAC2017 0 trips, esimated 82,000sf concrete and 62,000sf asphalt

Grading - Assumed 1,000cy of soil import and export

Vehicle Trips - Market = 100% primary trips to capture traffic reductions Traffic Trip Gen - apts = 5.44, 5.23, 4.79, market = 163.71, 191.46, 168.24, 2 mile C-C length for market for local per traffic correspondence

Vehicle Emission Factors - EMFAC2017 Emissions Factors Marin County

Woodstoves - No wood all gas

Water And Wastewater - WWTP 100% aerobic

Construction Off-road Equipment Mitigation - BMPs, Tier 4 mitigation

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	5,376.00	5,496.00
tblAreaCoating	Area_Parking	5376	5496
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblFireplaces	FireplaceWoodMass	228.80	0.00

tblFireplaces	NumberGas	28.80	61.44
tblFireplaces	NumberWood	32.64	0.00
tblFleetMix	HHD	0.01	0.01
tblFleetMix	HHD	0.01	0.01
tblFleetMix	HHD	0.01	0.01
tblFleetMix	HHD	0.01	0.01
tblFleetMix	LDA	0.60	0.54
tblFleetMix	LDA	0.60	0.54
tblFleetMix	LDA	0.60	0.54
tblFleetMix	LDA	0.60	0.54
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT2	0.20	0.20
tblFleetMix	LDT2	0.20	0.20
tblFleetMix	LDT2	0.20	0.20
tblFleetMix	LDT2	0.20	0.20
tblFleetMix	LHD1	0.02	0.03
tblFleetMix	LHD1	0.02	0.03
tblFleetMix	LHD1	0.02	0.03
tblFleetMix	LHD1	0.02	0.03
tblFleetMix	LHD2	5.1830e-003	6.0030e-003
tblFleetMix	LHD2	5.1830e-003	6.0030e-003
tblFleetMix	LHD2	5.1830e-003	6.0030e-003
tblFleetMix	LHD2	5.1830e-003	6.0030e-003
tblFleetMix	MCY	5.7450e-003	0.03
tblFleetMix	MCY	5.7450e-003	0.03
tblFleetMix	MCY	5.7450e-003	0.03
tblFleetMix	MCY	5.7450e-003	0.03

tblFleetMix	MDV	0.11	0.12
tblFleetMix	MDV	0.11	0.12
tblFleetMix	MDV	0.11	0.12
tblFleetMix	MDV	0.11	0.12
tblFleetMix	MH	7.2400e-004	8.2800e-004
tblFleetMix	MH	7.2400e-004	8.2800e-004
tblFleetMix	MH	7.2400e-004	8.2800e-004
tblFleetMix	MH	7.2400e-004	8.2800e-004
tblFleetMix	MHD	0.01	0.01
tblFleetMix	MHD	0.01	0.01
tblFleetMix	MHD	0.01	0.01
tblFleetMix	MHD	0.01	0.01
tblFleetMix	OBUS	2.0420e-003	1.1810e-003
tblFleetMix	OBUS	2.0420e-003	1.1810e-003
tblFleetMix	OBUS	2.0420e-003	1.1810e-003
tblFleetMix	OBUS	2.0420e-003	1.1810e-003
tblFleetMix	SBUS	6.9900e-004	7.5100e-004
tblFleetMix	SBUS	6.9900e-004	7.5100e-004
tblFleetMix	SBUS	6.9900e-004	7.5100e-004
tblFleetMix	SBUS	6.9900e-004	7.5100e-004
tblFleetMix	UBUS	3.0570e-003	7.5700e-004
tblFleetMix	UBUS	3.0570e-003	7.5700e-004
tblFleetMix	UBUS	3.0570e-003	7.5700e-004
tblFleetMix	UBUS	3.0570e-003	7.5700e-004
tblGrading	MaterialExported	0.00	1,000.00
tblGrading	MaterialImported	0.00	1,000.00
tblLandUse	LandUseSquareFeet	192,000.00	251,828.00
tblLandUse	LandUseSquareFeet	4,320.00	4,323.00
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators

tblProjectCharacteristics	CO2IntensityFactor	641.35	123
tblTripsAndVMT	HaulingTripNumber	250.00	0.00
tblTripsAndVMT	VendorTripNumber	36.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	177.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	35.00	0.00
tblVehicleEF	HHD	0.24	0.03
tblVehicleEF	HHD	0.09	0.10
tblVehicleEF	HHD	0.10	1.0000e-006
tblVehicleEF	HHD	1.52	5.97
tblVehicleEF	HHD	1.27	0.65
tblVehicleEF	HHD	5.95	0.03
tblVehicleEF	HHD	3,651.33	1,035.15
tblVehicleEF	HHD	1,601.08	1,510.83
tblVehicleEF	HHD	17.69	0.28
tblVehicleEF	HHD	14.38	5.67
tblVehicleEF	HHD	2.21	2.99
tblVehicleEF	HHD	18.68	2.37
tblVehicleEF	HHD	0.02	4.1740e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	7.0430e-003	0.02
tblVehicleEF	HHD	1.8900e-004	2.0000e-006
tblVehicleEF	HHD	0.01	3.9930e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.7370e-003	8.8400e-003

tblVehicleEF	HHD	6.7380e-003	0.02
tblVehicleEF	HHD	1.7400e-004	1.0000e-006
tblVehicleEF	HHD	1.6400e-004	6.0000e-006
tblVehicleEF	HHD	9.5410e-003	2.5900e-004
tblVehicleEF	HHD	0.39	0.41
tblVehicleEF	HHD	1.0700e-004	4.0000e-006
tblVehicleEF	HHD	0.09	0.03
tblVehicleEF	HHD	1.2060e-003	1.3290e-003
tblVehicleEF	HHD	0.17	5.0000e-006
tblVehicleEF	HHD	0.03	9.4910e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	2.7600e-004	3.0000e-006
tblVehicleEF	HHD	1.6400e-004	6.0000e-006
tblVehicleEF	HHD	9.5410e-003	2.5900e-004
tblVehicleEF	HHD	0.45	0.47
tblVehicleEF	HHD	1.0700e-004	4.0000e-006
tblVehicleEF	HHD	0.19	0.13
tblVehicleEF	HHD	1.2060e-003	1.3290e-003
tblVehicleEF	HHD	0.18	6.0000e-006
tblVehicleEF	LDA	3.6110e-003	2.2140e-003
tblVehicleEF	LDA	5.3810e-003	0.05
tblVehicleEF	LDA	0.48	0.56
tblVehicleEF	LDA	1.19	2.24
tblVehicleEF	LDA	242.87	249.91
tblVehicleEF	LDA	55.12	52.26
tblVehicleEF	LDA	0.05	0.04
tblVehicleEF	LDA	0.07	0.19
tblVehicleEF	LDA	1.7840e-003	1.5130e-003
tblVehicleEF	LDA	2.3120e-003	1.8150e-003
tblVehicleEF	LDA	1.6460e-003	1.3960e-003

tblVehicleEF	LDA	2.1260e-003	1.6690e-003
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	9.1730e-003	8.9230e-003
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.07	0.23
tblVehicleEF	LDA	2.4310e-003	1.4600e-004
tblVehicleEF	LDA	5.7100e-004	0.00
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.01	0.01
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.08	0.25
tblVehicleEF	LDT1	7.2490e-003	4.1550e-003
tblVehicleEF	LDT1	0.01	0.07
tblVehicleEF	LDT1	0.88	0.89
tblVehicleEF	LDT1	2.58	2.49
tblVehicleEF	LDT1	302.53	302.66
tblVehicleEF	LDT1	69.38	64.46
tblVehicleEF	LDT1	0.09	0.08
tblVehicleEF	LDT1	0.14	0.26
tblVehicleEF	LDT1	2.1500e-003	1.7860e-003
tblVehicleEF	LDT1	2.9780e-003	2.3660e-003
tblVehicleEF	LDT1	1.9800e-003	1.6440e-003
tblVehicleEF	LDT1	2.7390e-003	2.1750e-003
tblVehicleEF	LDT1	0.08	0.09
tblVehicleEF	LDT1	0.23	0.19
tblVehicleEF	LDT1	0.07	0.08

tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.16	0.70
tblVehicleEF	LDT1	0.17	0.35
tblVehicleEF	LDT1	3.0340e-003	2.9580e-003
tblVehicleEF	LDT1	7.3900e-004	0.00
tblVehicleEF	LDT1	0.08	0.09
tblVehicleEF	LDT1	0.23	0.19
tblVehicleEF	LDT1	0.07	0.08
tblVehicleEF	LDT1	0.03	0.03
tblVehicleEF	LDT1	0.16	0.70
tblVehicleEF	LDT1	0.18	0.39
tblVehicleEF	LDT2	4.8380e-003	3.0620e-003
tblVehicleEF	LDT2	6.7880e-003	0.07
tblVehicleEF	LDT2	0.61	0.70
tblVehicleEF	LDT2	1.49	2.84
tblVehicleEF	LDT2	340.99	325.37
tblVehicleEF	LDT2	77.70	69.03
tblVehicleEF	LDT2	0.07	0.06
tblVehicleEF	LDT2	0.11	0.28
tblVehicleEF	LDT2	1.6990e-003	1.4330e-003
tblVehicleEF	LDT2	2.2870e-003	1.7620e-003
tblVehicleEF	LDT2	1.5630e-003	1.3200e-003
tblVehicleEF	LDT2	2.1020e-003	1.6200e-003
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.11	0.12
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.01	0.01
tblVehicleEF	LDT2	0.07	0.45
tblVehicleEF	LDT2	0.09	0.32
tblVehicleEF	LDT2	3.4130e-003	0.01

tblVehicleEF	LDT2	8.0200e-004	1.4100e-004
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.11	0.12
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.45
tblVehicleEF	LDT2	0.10	0.35
tblVehicleEF	LHD1	5.0650e-003	4.9220e-003
tblVehicleEF	LHD1	0.02	9.7330e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.14	0.18
tblVehicleEF	LHD1	1.15	0.91
tblVehicleEF	LHD1	2.65	1.08
tblVehicleEF	LHD1	9.14	9.12
tblVehicleEF	LHD1	684.70	789.26
tblVehicleEF	LHD1	30.22	11.27
tblVehicleEF	LHD1	0.08	0.07
tblVehicleEF	LHD1	1.43	0.96
tblVehicleEF	LHD1	0.96	0.31
tblVehicleEF	LHD1	9.5600e-004	9.0500e-004
tblVehicleEF	LHD1	0.01	9.8510e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	9.8600e-004	2.6600e-004
tblVehicleEF	LHD1	9.1500e-004	8.6600e-004
tblVehicleEF	LHD1	2.5470e-003	2.4630e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	9.0700e-004	2.4500e-004
tblVehicleEF	LHD1	2.3140e-003	1.8380e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.02

tblVehicleEF	LHD1	1.3030e-003	1.0320e-003
tblVehicleEF	LHD1	0.13	0.11
tblVehicleEF	LHD1	0.36	0.59
tblVehicleEF	LHD1	0.26	0.08
tblVehicleEF	LHD1	9.1000e-005	8.8000e-005
tblVehicleEF	LHD1	6.7140e-003	7.6990e-003
tblVehicleEF	LHD1	3.5200e-004	1.1200e-004
tblVehicleEF	LHD1	2.3140e-003	1.8380e-003
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	1.3030e-003	1.0320e-003
tblVehicleEF	LHD1	0.17	0.13
tblVehicleEF	LHD1	0.36	0.59
tblVehicleEF	LHD1	0.29	0.08
tblVehicleEF	LHD2	3.3850e-003	3.3010e-003
tblVehicleEF	LHD2	7.4260e-003	7.2450e-003
tblVehicleEF	LHD2	6.8280e-003	9.0350e-003
tblVehicleEF	LHD2	0.12	0.14
tblVehicleEF	LHD2	0.55	0.65
tblVehicleEF	LHD2	1.17	0.67
tblVehicleEF	LHD2	13.99	13.94
tblVehicleEF	LHD2	706.47	776.69
tblVehicleEF	LHD2	24.12	8.18
tblVehicleEF	LHD2	0.10	0.10
tblVehicleEF	LHD2	0.69	0.85
tblVehicleEF	LHD2	0.46	0.20
tblVehicleEF	LHD2	1.2400e-003	1.3770e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	4.0700e-004	1.3500e-004

tblVehicleEF	LHD2	1.1860e-003	1.3180e-003
tblVehicleEF	LHD2	2.6910e-003	2.6780e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.7400e-004	1.2400e-004
tblVehicleEF	LHD2	6.7600e-004	9.5300e-004
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	4.1300e-004	5.5300e-004
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.09	0.05
tblVehicleEF	LHD2	1.3600e-004	1.3300e-004
tblVehicleEF	LHD2	6.8700e-003	7.5040e-003
tblVehicleEF	LHD2	2.6200e-004	8.1000e-005
tblVehicleEF	LHD2	6.7600e-004	9.5300e-004
tblVehicleEF	LHD2	0.03	0.04
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.1300e-004	5.5300e-004
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.07	0.27
tblVehicleEF	LHD2	0.10	0.05
tblVehicleEF	MCY	0.46	0.34
tblVehicleEF	MCY	0.17	0.26
tblVehicleEF	MCY	20.84	21.09
tblVehicleEF	MCY	10.26	9.10
tblVehicleEF	MCY	176.52	218.23
tblVehicleEF	MCY	46.06	62.24
tblVehicleEF	MCY	1.19	1.19
tblVehicleEF	MCY	0.32	0.28
tblVehicleEF	MCY	2.1620e-003	2.1050e-003

tblVehicleEF	MCY	4.2640e-003	3.4540e-003
tblVehicleEF	MCY	2.0240e-003	1.9710e-003
tblVehicleEF	MCY	4.0250e-003	3.2580e-003
tblVehicleEF	MCY	0.78	1.58
tblVehicleEF	MCY	0.77	0.77
tblVehicleEF	MCY	0.48	0.97
tblVehicleEF	MCY	2.34	2.36
tblVehicleEF	MCY	0.75	2.44
tblVehicleEF	MCY	2.28	2.02
tblVehicleEF	MCY	2.1740e-003	2.1600e-003
tblVehicleEF	MCY	6.9600e-004	6.1600e-004
tblVehicleEF	MCY	0.78	1.58
tblVehicleEF	MCY	0.77	0.77
tblVehicleEF	MCY	0.48	0.97
tblVehicleEF	MCY	2.90	2.91
tblVehicleEF	MCY	0.75	2.44
tblVehicleEF	MCY	2.49	2.20
tblVehicleEF	MDV	7.9200e-003	3.6200e-003
tblVehicleEF	MDV	0.01	0.08
tblVehicleEF	MDV	0.86	0.76
tblVehicleEF	MDV	2.62	3.10
tblVehicleEF	MDV	453.75	393.10
tblVehicleEF	MDV	101.78	81.38
tblVehicleEF	MDV	0.11	0.08
tblVehicleEF	MDV	0.22	0.31
tblVehicleEF	MDV	1.7880e-003	1.5790e-003
tblVehicleEF	MDV	2.3970e-003	1.8570e-003
tblVehicleEF	MDV	1.6480e-003	1.4590e-003
tblVehicleEF	MDV	2.2040e-003	1.7080e-003
tblVehicleEF	MDV	0.05	0.06

tblVehicleEF	MDV	0.16	0.13
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	0.10	0.44
tblVehicleEF	MDV	0.19	0.37
tblVehicleEF	MDV	4.5380e-003	3.8350e-003
tblVehicleEF	MDV	1.0630e-003	7.9500e-004
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.16	0.13
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.10	0.44
tblVehicleEF	MDV	0.21	0.41
tblVehicleEF	MH	0.03	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.92	1.02
tblVehicleEF	MH	5.40	2.05
tblVehicleEF	MH	1,205.43	1,506.76
tblVehicleEF	MH	56.49	17.63
tblVehicleEF	MH	1.38	1.49
tblVehicleEF	MH	0.78	0.23
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	1.0790e-003	2.5600e-004
tblVehicleEF	MH	3.2430e-003	3.3090e-003
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	9.9200e-004	2.3500e-004
tblVehicleEF	MH	0.63	0.56
tblVehicleEF	MH	0.06	0.05
tblVehicleEF	MH	0.24	0.21

tblVehicleEF	MH	0.09	0.07
tblVehicleEF	MH	0.02	1.33
tblVehicleEF	MH	0.31	0.09
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.5900e-004	1.7400e-004
tblVehicleEF	MH	0.63	0.56
tblVehicleEF	MH	0.06	0.05
tblVehicleEF	MH	0.24	0.21
tblVehicleEF	MH	0.13	0.09
tblVehicleEF	MH	0.02	1.33
tblVehicleEF	MH	0.34	0.10
tblVehicleEF	MHD	0.02	5.1550e-003
tblVehicleEF	MHD	6.1250e-003	3.4110e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.42	0.53
tblVehicleEF	MHD	0.44	0.42
tblVehicleEF	MHD	7.10	1.77
tblVehicleEF	MHD	115.22	98.88
tblVehicleEF	MHD	1,194.84	1,160.60
tblVehicleEF	MHD	70.23	14.20
tblVehicleEF	MHD	0.36	0.67
tblVehicleEF	MHD	1.13	1.46
tblVehicleEF	MHD	8.77	1.49
tblVehicleEF	MHD	1.7500e-004	6.1600e-004
tblVehicleEF	MHD	3.3480e-003	6.8520e-003
tblVehicleEF	MHD	1.0000e-003	1.7000e-004
tblVehicleEF	MHD	1.6800e-004	5.8900e-004
tblVehicleEF	MHD	3.1950e-003	6.5450e-003
tblVehicleEF	MHD	9.2000e-004	1.5600e-004
tblVehicleEF	MHD	9.4300e-004	5.8100e-004

tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	5.5900e-004	3.4100e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.03	0.19
tblVehicleEF	MHD	0.42	0.08
tblVehicleEF	MHD	1.1140e-003	9.3900e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	8.2600e-004	1.4100e-004
tblVehicleEF	MHD	9.4300e-004	5.8100e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	5.5900e-004	3.4100e-004
tblVehicleEF	MHD	0.06	0.03
tblVehicleEF	MHD	0.03	0.19
tblVehicleEF	MHD	0.46	0.09
tblVehicleEF	OBUS	0.01	9.3120e-003
tblVehicleEF	OBUS	9.6260e-003	8.0720e-003
tblVehicleEF	OBUS	0.03	0.03
tblVehicleEF	OBUS	0.24	0.49
tblVehicleEF	OBUS	0.62	0.87
tblVehicleEF	OBUS	6.07	2.79
tblVehicleEF	OBUS	72.39	62.77
tblVehicleEF	OBUS	1,287.50	1,557.63
tblVehicleEF	OBUS	69.60	22.39
tblVehicleEF	OBUS	0.14	0.22
tblVehicleEF	OBUS	0.80	0.97
tblVehicleEF	OBUS	2.29	0.61
tblVehicleEF	OBUS	1.3000e-005	7.3000e-005
tblVehicleEF	OBUS	2.3590e-003	5.4720e-003

tblVehicleEF	OBUS	8.1000e-004	1.9400e-004
tblVehicleEF	OBUS	1.2000e-005	7.0000e-005
tblVehicleEF	OBUS	2.2350e-003	5.2110e-003
tblVehicleEF	OBUS	7.4500e-004	1.7900e-004
tblVehicleEF	OBUS	1.2620e-003	1.2770e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	6.0000e-004	6.3100e-004
tblVehicleEF	OBUS	0.05	0.04
tblVehicleEF	OBUS	0.06	0.27
tblVehicleEF	OBUS	0.37	0.13
tblVehicleEF	OBUS	7.0300e-004	6.0000e-004
tblVehicleEF	OBUS	0.01	0.02
tblVehicleEF	OBUS	8.0200e-004	2.2200e-004
tblVehicleEF	OBUS	1.2620e-003	1.2770e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.06
tblVehicleEF	OBUS	6.0000e-004	6.3100e-004
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	0.06	0.27
tblVehicleEF	OBUS	0.41	0.14
tblVehicleEF	SBUS	0.85	0.05
tblVehicleEF	SBUS	0.01	8.8290e-003
tblVehicleEF	SBUS	0.07	4.7030e-003
tblVehicleEF	SBUS	6.29	1.96
tblVehicleEF	SBUS	0.81	0.79
tblVehicleEF	SBUS	6.94	0.73
tblVehicleEF	SBUS	1,215.38	345.64
tblVehicleEF	SBUS	1,113.54	1,061.23
tblVehicleEF	SBUS	41.00	3.75

tblVehicleEF	SBUS	10.27	4.16
tblVehicleEF	SBUS	4.21	6.27
tblVehicleEF	SBUS	14.36	0.60
tblVehicleEF	SBUS	9.8040e-003	4.8010e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.02	0.04
tblVehicleEF	SBUS	7.8300e-004	5.5000e-005
tblVehicleEF	SBUS	9.3800e-003	4.5940e-003
tblVehicleEF	SBUS	2.7280e-003	2.7290e-003
tblVehicleEF	SBUS	0.02	0.04
tblVehicleEF	SBUS	7.2000e-004	5.1000e-005
tblVehicleEF	SBUS	1.8370e-003	4.6000e-004
tblVehicleEF	SBUS	0.02	5.6060e-003
tblVehicleEF	SBUS	0.75	0.22
tblVehicleEF	SBUS	8.3000e-004	1.8900e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.04
tblVehicleEF	SBUS	0.34	0.03
tblVehicleEF	SBUS	0.01	3.2870e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	5.2900e-004	3.7000e-005
tblVehicleEF	SBUS	1.8370e-003	4.6000e-004
tblVehicleEF	SBUS	0.02	5.6060e-003
tblVehicleEF	SBUS	1.08	0.32
tblVehicleEF	SBUS	8.3000e-004	1.8900e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.04
tblVehicleEF	SBUS	0.37	0.03
tblVehicleEF	UBUS	0.28	0.43
tblVehicleEF	UBUS	0.03	0.03

tblVehicleEF	UBUS	4.79	3.29
tblVehicleEF	UBUS	4.89	2.39
tblVehicleEF	UBUS	2,170.62	1,810.09
tblVehicleEF	UBUS	69.77	26.71
tblVehicleEF	UBUS	12.17	0.50
tblVehicleEF	UBUS	16.76	0.26
tblVehicleEF	UBUS	0.68	0.11
tblVehicleEF	UBUS	0.01	0.02
tblVehicleEF	UBUS	0.25	3.3890e-003
tblVehicleEF	UBUS	5.7100e-004	2.0600e-004
tblVehicleEF	UBUS	0.29	0.05
tblVehicleEF	UBUS	3.0000e-003	5.0890e-003
tblVehicleEF	UBUS	0.24	3.2100e-003
tblVehicleEF	UBUS	5.2500e-004	1.8900e-004
tblVehicleEF	UBUS	1.3670e-003	1.1410e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	8.5900e-004	7.5400e-004
tblVehicleEF	UBUS	0.64	0.02
tblVehicleEF	UBUS	5.6660e-003	0.10
tblVehicleEF	UBUS	0.40	0.14
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	7.8600e-004	2.6400e-004
tblVehicleEF	UBUS	1.3670e-003	1.1410e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	8.5900e-004	7.5400e-004
tblVehicleEF	UBUS	0.98	0.45
tblVehicleEF	UBUS	5.6660e-003	0.10
tblVehicleEF	UBUS	0.44	0.16
tblVehicleTrips	CC_TL	7.30	2.00
tblVehicleTrips	DV_TP	15.00	0.00

tblVehicleTrips	PB_TP	61.00	0.00
tblVehicleTrips	PR_TP	24.00	100.00
tblVehicleTrips	ST_TR	6.39	5.23
tblVehicleTrips	ST_TR	863.10	191.46
tblVehicleTrips	SU_TR	5.86	4.79
tblVehicleTrips	SU_TR	758.45	168.24
tblVehicleTrips	WD_TR	6.65	5.44
tblVehicleTrips	WD_TR	737.99	163.71
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	582.40	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

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

Year	tons/yr										MT/yr					
2021	0.2757	2.6149	2.2481	3.7400e-003	0.1560	0.1391	0.2950	0.0834	0.1301	0.2135	0.0000	323.6252	323.6252	0.0833	0.0000	325.7066
2022	1.8451	0.2815	0.3276	5.3000e-004	0.0000	0.0146	0.0146	0.0000	0.0137	0.0137	0.0000	45.7533	45.7533	0.0122	0.0000	46.0582
Maximum	**1.8451**	**2.6149**	**2.2481**	**3.7400e-003**	**0.1560**	**0.1391**	**0.2950**	**0.0834**	**0.1301**	**0.2135**	**0.0000**	**323.6252**	**323.6252**	**0.0833**	**0.0000**	**325.7066**

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	0.2757	2.6149	2.2481	3.7400e-003	0.0702	0.1391	0.2093	0.0188	0.1301	0.1489	0.0000	323.6248	323.6248	0.0833	0.0000	325.7062
2022	1.8451	0.2815	0.3276	5.3000e-004	0.0000	0.0146	0.0146	0.0000	0.0137	0.0137	0.0000	45.7533	45.7533	0.0122	0.0000	46.0582
Maximum	**1.8451**	**2.6149**	**2.2481**	**3.7400e-003**	**0.0702**	**0.1391**	**0.2093**	**0.0188**	**0.1301**	**0.1489**	**0.0000**	**323.6248**	**323.6248**	**0.0833**	**0.0000**	**325.7062**

	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**	**55.00**	**0.00**	**27.70**	**77.50**	**0.00**	**28.44**	**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	**1-4-2021**	**4-3-2021**	0.9878	0.9878
2	**4-4-2021**	**7-3-2021**	0.6283	0.6283
3	**7-4-2021**	**10-3-2021**	0.6352	0.6352
4	**10-4-2021**	**1-3-2022**	0.6331	0.6331
5	**1-4-2022**	**4-3-2022**	2.1081	2.1081
		Highest	2.1081	2.1081

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.2316	0.0231	1.4309	1.2000e-004		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	10.0029	10.0029	2.4000e-003	1.4000e-004	10.1048
Energy	9.1500e-003	0.0782	0.0337	5.0000e-004		6.3200e-003	6.3200e-003		6.3200e-003	6.3200e-003	0.0000	161.0423	161.0423	0.0184	5.1000e-003	163.0212
Mobile	0.9879	0.8098	6.1590	0.0125	1.1654	9.1800e-003	1.1746	0.3114	8.5600e-003	0.3200	0.0000	1,083.1630	1,083.1630	0.0842	0.0000	1,085.2669
Waste						0.0000	0.0000		0.0000	0.0000	20.5630	0.0000	20.5630	1.2152	0.0000	50.9439
Water						0.0000	0.0000		0.0000	0.0000	4.5391	5.4514	9.9905	0.0169	0.0101	13.4341
Total	**2.2286**	**0.9111**	**7.6236**	**0.0132**	**1.1654**	**0.0239**	**1.1893**	**0.3114**	**0.0233**	**0.3347**	**25.1021**	**1,259.6597**	**1,284.7618**	**1.3371**	**0.0154**	**1,322.7708**

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	1.2316	0.0231	1.4309	1.2000e-004		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	10.0029	10.0029	2.4000e-003	1.4000e-004	10.1048
Energy	9.1500e-003	0.0782	0.0337	5.0000e-004		6.3200e-003	6.3200e-003		6.3200e-003	6.3200e-003	0.0000	161.0423	161.0423	0.0184	5.1000e-003	163.0212
Mobile	0.9879	0.8098	6.1590	0.0125	1.1654	9.1800e-003	1.1746	0.3114	8.5600e-003	0.3200	0.0000	1,083.1630	1,083.1630	0.0842	0.0000	1,085.2669
Waste						0.0000	0.0000		0.0000	0.0000	20.5630	0.0000	20.5630	1.2152	0.0000	50.9439
Water						0.0000	0.0000		0.0000	0.0000	4.5391	5.4514	9.9905	0.0169	0.0101	13.4341
Total	**2.2286**	**0.9111**	**7.6236**	**0.0132**	**1.1654**	**0.0239**	**1.1893**	**0.3114**	**0.0233**	**0.3347**	**25.1021**	**1,259.6597**	**1,284.7618**	**1.3371**	**0.0154**	**1,322.7708**

	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	1/4/2021	1/29/2021	5	20	
2	Site Preparation	Site Preparation	1/30/2021	2/12/2021	5	10	
3	Grading	Grading	2/13/2021	3/12/2021	5	20	
4	Trenching	Trenching	2/13/2021	2/26/2021	5	10	
5	Building Construction	Building Construction	3/13/2021	1/28/2022	5	230	
6	Paving	Paving	1/29/2022	2/25/2022	5	20	
7	Architectural Coating	Architectural Coating	2/26/2022	3/25/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 2.02

Residential Indoor: 509,952; Residential Outdoor: 169,984; Non-Residential Indoor: 6,485; Non-Residential Outdoor: 2,162; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41

Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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	6	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	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
Building Construction	9	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	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

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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					
Off-Road	0.0317	0.3144	0.2157	3.9000e-004		0.0155	0.0155		0.0144	0.0144	0.0000	34.0008	34.0008	9.5700e-003	0.0000	34.2400
Total	**0.0317**	**0.3144**	**0.2157**	**3.9000e-004**		**0.0155**	**0.0155**		**0.0144**	**0.0144**	**0.0000**	**34.0008**	**34.0008**	**9.5700e-003**	**0.0000**	**34.2400**

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	0.0317	0.3144	0.2157	3.9000e-004		0.0155	0.0155		0.0144	0.0144	0.0000	34.0007	34.0007	9.5700e-003	0.0000	34.2400
Total	**0.0317**	**0.3144**	**0.2157**	**3.9000e-004**		**0.0155**	**0.0155**		**0.0144**	**0.0144**	**0.0000**	**34.0007**	**34.0007**	**9.5700e-003**	**0.0000**	**34.2400**

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

	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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0903**	**0.0102**	**0.1006**	**0.0497**	**9.4000e-003**	**0.0591**	**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

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					
Fugitive Dust					0.0407	0.0000	0.0407	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0407**	**0.0102**	**0.0509**	**0.0112**	**9.4000e-003**	**0.0206**	**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

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

	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					0.0656	0.0000	0.0656	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0229	0.2474	0.1586	3.0000e-004		0.0116	0.0116		0.0107	0.0107	0.0000	26.0537	26.0537	8.4300e-003	0.0000	26.2644
Total	**0.0229**	**0.2474**	**0.1586**	**3.0000e-004**	**0.0656**	**0.0116**	**0.0772**	**0.0337**	**0.0107**	**0.0444**	**0.0000**	**26.0537**	**26.0537**	**8.4300e-003**	**0.0000**	**26.2644**

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					
Fugitive Dust					0.0295	0.0000	0.0295	7.5800e-003	0.0000	7.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0229	0.2474	0.1586	3.0000e-004		0.0116	0.0116		0.0107	0.0107	0.0000	26.0537	26.0537	8.4300e-003	0.0000	26.2643
Total	**0.0229**	**0.2474**	**0.1586**	**3.0000e-004**	**0.0295**	**0.0116**	**0.0411**	**7.5800e-003**	**0.0107**	**0.0183**	**0.0000**	**26.0537**	**26.0537**	**8.4300e-003**	**0.0000**	**26.2643**

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 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	2.0800e-003	0.0203	0.0277	4.0000e-005		1.0800e-003	1.0800e-003		9.9000e-004	9.9000e-004	0.0000	3.6337	3.6337	1.1800e-003	0.0000	3.6631
Total	**2.0800e-003**	**0.0203**	**0.0277**	**4.0000e-005**		**1.0800e-003**	**1.0800e-003**		**9.9000e-004**	**9.9000e-004**	**0.0000**	**3.6337**	**3.6337**	**1.1800e-003**	**0.0000**	**3.6631**

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	2.0800e-003	0.0203	0.0277	4.0000e-005		1.0800e-003	1.0800e-003		9.9000e-004	9.9000e-004	0.0000	3.6337	3.6337	1.1800e-003	0.0000	3.6631
Total	**2.0800e-003**	**0.0203**	**0.0277**	**4.0000e-005**		**1.0800e-003**	**1.0800e-003**		**9.9000e-004**	**9.9000e-004**	**0.0000**	**3.6337**	**3.6337**	**1.1800e-003**	**0.0000**	**3.6631**

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 Building Construction - 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	0.1996	1.8304	1.7404	2.8300e-003		0.1007	0.1007		0.0946	0.0946	0.0000	243.2191	243.2191	0.0587	0.0000	244.6861
Total	**0.1996**	**1.8304**	**1.7404**	**2.8300e-003**		**0.1007**	**0.1007**		**0.0946**	**0.0946**	**0.0000**	**243.2191**	**243.2191**	**0.0587**	**0.0000**	**244.6861**

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	0.1996	1.8304	1.7404	2.8300e-003		0.1007	0.1007		0.0946	0.0946	0.0000	243.2189	243.2189	0.0587	0.0000	244.6858
Total	**0.1996**	**1.8304**	**1.7404**	**2.8300e-003**		**0.1007**	**0.1007**		**0.0946**	**0.0946**	**0.0000**	**243.2189**	**243.2189**	**0.0587**	**0.0000**	**244.6858**

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 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
Category	tons/yr										MT/yr					
Off-Road	0.0171	0.1562	0.1636	2.7000e-004		8.0900e-003	8.0900e-003		7.6100e-003	7.6100e-003	0.0000	23.1725	23.1725	5.5500e-003	0.0000	23.3113
Total	**0.0171**	**0.1562**	**0.1636**	**2.7000e-004**		**8.0900e-003**	**8.0900e-003**		**7.6100e-003**	**7.6100e-003**	**0.0000**	**23.1725**	**23.1725**	**5.5500e-003**	**0.0000**	**23.3113**

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	0.0171	0.1562	0.1636	2.7000e-004		8.0900e-003	8.0900e-003		7.6100e-003	7.6100e-003	0.0000	23.1725	23.1725	5.5500e-003	0.0000	23.3113
Total	**0.0171**	**0.1562**	**0.1636**	**2.7000e-004**		**8.0900e-003**	**8.0900e-003**		**7.6100e-003**	**7.6100e-003**	**0.0000**	**23.1725**	**23.1725**	**5.5500e-003**	**0.0000**	**23.3113**

Mitigated Construction Off-Site

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

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Paving - 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	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving	6.3000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0117**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0276**	**20.0276**	**6.4800e-003**	**0.0000**	**20.1895**

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	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving	6.3000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0117**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0275**	**20.0275**	**6.4800e-003**	**0.0000**	**20.1895**

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 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	1.8144					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0500e-003	0.0141	0.0181	3.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total	**1.8164**	**0.0141**	**0.0181**	**3.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.7000e-004**	**0.0000**	**2.5574**

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	1.8144					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0500e-003	0.0141	0.0181	3.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total	**1.8164**	**0.0141**	**0.0181**	**3.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.7000e-004**	**0.0000**	**2.5574**

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					

Mitigated	0.9879	0.8098	6.1590	0.0125	1.1654	9.1800e-003	1.1746	0.3114	8.5600e-003	0.3200	0.0000	1,083.1630	1,083.1630	0.0842	0.0000	1,085.2669
Unmitigated	0.9879	0.8098	6.1590	0.0125	1.1654	9.1800e-003	1.1746	0.3114	8.5600e-003	0.3200	0.0000	1,083.1630	1,083.1630	0.0842	0.0000	1,085.2669

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,044.48	1,004.16	919.68	2,357,858	2,357,858
Convenience Market (24 Hour)	707.23	827.11	726.80	813,765	813,765
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	1,751.71	1,831.27	1,646.48	3,171,623	3,171,623

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-...	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Convenience Market (24 Hour)	9.50	2.00	7.30	0.90	80.10	19.00	100	0	0
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.539269	0.058850	0.200029	0.117291	0.025913	0.006003	0.010385	0.010246	0.001181	0.000757	0.028495	0.000751	0.000828
Convenience Market (24 Hour)	0.539269	0.058850	0.200029	0.117291	0.025913	0.006003	0.010385	0.010246	0.001181	0.000757	0.028495	0.000751	0.000828
Enclosed Parking with Elevator	0.539269	0.058850	0.200029	0.117291	0.025913	0.006003	0.010385	0.010246	0.001181	0.000757	0.028495	0.000751	0.000828
Parking Lot	0.539269	0.058850	0.200029	0.117291	0.025913	0.006003	0.010385	0.010246	0.001181	0.000757	0.028495	0.000751	0.000828

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	70.5305	70.5305	0.0166	3.4400e-003	71.9715
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	70.5305	70.5305	0.0166	3.4400e-003	71.9715
NaturalGas Mitigated	9.1500e-003	0.0782	0.0337	5.0000e-004		6.3200e-003	6.3200e-003		6.3200e-003	6.3200e-003	0.0000	90.5119	90.5119	1.7300e-003	1.6600e-003	91.0497
NaturalGas Unmitigated	9.1500e-003	0.0782	0.0337	5.0000e-004		6.3200e-003	6.3200e-003		6.3200e-003	6.3200e-003	0.0000	90.5119	90.5119	1.7300e-003	1.6600e-003	91.0497

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					
Apartments Mid Rise	1.67624e+006	9.0400e-003	0.0772	0.0329	4.9000e-004		6.2400e-003	6.2400e-003		6.2400e-003	6.2400e-003	0.0000	89.4507	89.4507	1.7100e-003	1.6400e-003	89.9823
Convenience Market (24 Hour)	19885.8	1.1000e-004	9.7000e-004	8.2000e-004	1.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	1.0612	1.0612	2.0000e-005	2.0000e-005	1.0675
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**9.1500e-003**	**0.0782**	**0.0337**	**5.0000e-004**		**6.3100e-003**	**6.3100e-003**		**6.3100e-003**	**6.3100e-003**	**0.0000**	**90.5119**	**90.5119**	**1.7300e-003**	**1.6600e-003**	**91.0497**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	1.67624e+006	9.0400e-003	0.0772	0.0329	4.9000e-004		6.2400e-003	6.2400e-003		6.2400e-003	6.2400e-003	0.0000	89.4507	89.4507	1.7100e-003	1.6400e-003	89.9823
Convenience Market (24 Hour)	19885.8	1.1000e-004	9.7000e-004	8.2000e-004	1.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	1.0612	1.0612	2.0000e-005	2.0000e-005	1.0675
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**9.1500e-003**	**0.0782**	**0.0337**	**5.0000e-004**		**6.3100e-003**	**6.3100e-003**		**6.3100e-003**	**6.3100e-003**	**0.0000**	**90.5119**	**90.5119**	**1.7300e-003**	**1.6600e-003**	**91.0497**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	810622	45.2261	0.0107	2.2100e-003	46.1501
Convenience Market (24 Hour)	45305	2.5277	6.0000e-004	1.2000e-004	2.5793
Enclosed Parking with Elevator	400824	22.3627	5.2700e-003	1.0900e-003	22.8196
Parking Lot	7420	0.4140	1.0000e-004	2.0000e-005	0.4224
Total		**70.5305**	**0.0166**	**3.4400e-003**	**71.9715**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	810622	45.2261	0.0107	2.2100e-003	46.1501
Convenience Market (24 Hour)	45305	2.5277	6.0000e-004	1.2000e-004	2.5793
Enclosed Parking with Elevator	400824	22.3627	5.2700e-003	1.0900e-003	22.8196
Parking Lot	7420	0.4140	1.0000e-004	2.0000e-005	0.4224
Total		**70.5305**	**0.0166**	**3.4400e-003**	**71.9715**

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	1.2316	0.0231	1.4309	1.2000e-004		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	10.0029	10.0029	2.4000e-003	1.4000e-004	10.1048
Unmitigated	1.2316	0.0231	1.4309	1.2000e-004		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	10.0029	10.0029	2.4000e-003	1.4000e-004	10.1048

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1814					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0062					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.8000e-004	6.6200e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.6701	7.6701	1.5000e-004	1.4000e-004	7.7157
Landscaping	0.0432	0.0165	1.4280	8.0000e-005		7.9000e-003	7.9000e-003		7.9000e-003	7.9000e-003	0.0000	2.3328	2.3328	2.2500e-003	0.0000	2.3891
Total	**1.2316**	**0.0231**	**1.4309**	**1.2000e-004**		**8.4400e-003**	**8.4400e-003**		**8.4400e-003**	**8.4400e-003**	**0.0000**	**10.0029**	**10.0029**	**2.4000e-003**	**1.4000e-004**	**10.1048**

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	0.1814					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0062					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.8000e-004	6.6200e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.6701	7.6701	1.5000e-004	1.4000e-004	7.7157
Landscaping	0.0432	0.0165	1.4280	8.0000e-005		7.9000e-003	7.9000e-003		7.9000e-003	7.9000e-003	0.0000	2.3328	2.3328	2.2500e-003	0.0000	2.3891
Total	**1.2316**	**0.0231**	**1.4309**	**1.2000e-004**		**8.4400e-003**	**8.4400e-003**		**8.4400e-003**	**8.4400e-003**	**0.0000**	**10.0029**	**10.0029**	**2.4000e-003**	**1.4000e-004**	**10.1048**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	9.9905	0.0169	0.0101	13.4341
Unmitigated	9.9905	0.0169	0.0101	13.4341

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	12.5096 / 7.88647	9.7424	0.0165	9.8800e-003	13.1001
Convenience Market (24 Hour)	0.319993 / 0.196125	0.2481	4.2000e-004	2.5000e-004	0.3340
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**9.9905**	**0.0169**	**0.0101**	**13.4341**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	12.5096 / 7.88647	9.7424	0.0165	9.8800e-003	13.1001
Convenience Market (24 Hour)	0.319993 / 0.196125	0.2481	4.2000e-004	2.5000e-004	0.3340
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**9.9905**	**0.0169**	**0.0101**	**13.4341**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	20.5630	1.2152	0.0000	50.9439
Unmitigated	20.5630	1.2152	0.0000	50.9439

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	88.32	17.9282	1.0595	0.0000	44.4163
Convenience Market (24 Hour)	12.98	2.6348	0.1557	0.0000	6.5277
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**20.5630**	**1.2152**	**0.0000**	**50.9439**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	88.32	17.9282	1.0595	0.0000	44.4163
Convenience Market (24 Hour)	12.98	2.6348	0.1557	0.0000	6.5277
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**20.5630**	**1.2152**	**0.0000**	**50.9439**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Los Gamos Neighborhood, San Rafael - Marin County, Annual

Los Gamos Neighborhood, San Rafael - 2030

Marin County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	171.00	Space	1.54	68,400.00	0
Parking Lot	53.00	Space	0.48	21,200.00	0
Apartments Mid Rise	192.00	Dwelling Unit	5.05	251,828.00	549
Convenience Market (24 Hour)	4.32	1000sqft	0.10	4,323.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	69
Climate Zone	5			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	123	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - MCE 2017 Rate = 109, PG&E 2017 rate = 210, (109*0.86)+(210*0.14) = 123

Land Use - Provided land uses - traffic and statistics sheet

Construction Phase - Default construction, trenching added

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Default construciton

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - trenching added

Trips and VMT - EMFAC2017 0 trips, esimated 82,000sf concrete and 62,000sf asphalt

Grading - Assumed 1,000cy of soil import and export

Vehicle Trips - Market = 100% primary trips to capture traffic reductions Traffic Trip Gen - apts = 5.44, 5.23, 4.79, market = 163.71, 191.46, 168.24, 2 mile C-C length for market for local per traffic correspondence

Vehicle Emission Factors - EMFAC2017 Emissions Factors Marin County

Woodstoves - No wood all gas

Water And Wastewater - WWTP 100% aerobic

Construction Off-road Equipment Mitigation - BMPs, Tier 4 mitigation

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Parking	5,376.00	5,496.00
tblAreaCoating	Area_Parking	5376	5496
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblFireplaces	FireplaceWoodMass	228.80	0.00

tblFireplaces	NumberGas	28.80	61.44
tblFireplaces	NumberWood	32.64	0.00
tblFleetMix	HHD	0.01	0.01
tblFleetMix	HHD	0.01	0.01
tblFleetMix	HHD	0.01	0.01
tblFleetMix	HHD	0.01	0.01
tblFleetMix	LDA	0.61	0.55
tblFleetMix	LDA	0.61	0.55
tblFleetMix	LDA	0.61	0.55
tblFleetMix	LDA	0.61	0.55
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD2	5.2640e-003	6.3811e-003
tblFleetMix	LHD2	5.2640e-003	6.3811e-003
tblFleetMix	LHD2	5.2640e-003	6.3811e-003
tblFleetMix	LHD2	5.2640e-003	6.3811e-003
tblFleetMix	MCY	5.5130e-003	0.03
tblFleetMix	MCY	5.5130e-003	0.03
tblFleetMix	MCY	5.5130e-003	0.03
tblFleetMix	MCY	5.5130e-003	0.03

tblFleetMix	MDV	0.11	0.12
tblFleetMix	MDV	0.11	0.12
tblFleetMix	MDV	0.11	0.12
tblFleetMix	MDV	0.11	0.12
tblFleetMix	MH	6.7300e-004	8.2165e-004
tblFleetMix	MH	6.7300e-004	8.2165e-004
tblFleetMix	MH	6.7300e-004	8.2165e-004
tblFleetMix	MH	6.7300e-004	8.2165e-004
tblFleetMix	MHD	0.01	0.01
tblFleetMix	MHD	0.01	0.01
tblFleetMix	MHD	0.01	0.01
tblFleetMix	MHD	0.01	0.01
tblFleetMix	OBUS	2.0580e-003	1.1227e-003
tblFleetMix	OBUS	2.0580e-003	1.1227e-003
tblFleetMix	OBUS	2.0580e-003	1.1227e-003
tblFleetMix	OBUS	2.0580e-003	1.1227e-003
tblFleetMix	SBUS	7.5500e-004	8.1380e-004
tblFleetMix	SBUS	7.5500e-004	8.1380e-004
tblFleetMix	SBUS	7.5500e-004	8.1380e-004
tblFleetMix	SBUS	7.5500e-004	8.1380e-004
tblFleetMix	UBUS	2.2880e-003	7.4412e-004
tblFleetMix	UBUS	2.2880e-003	7.4412e-004
tblFleetMix	UBUS	2.2880e-003	7.4412e-004
tblFleetMix	UBUS	2.2880e-003	7.4412e-004
tblGrading	MaterialExported	0.00	1,000.00
tblGrading	MaterialImported	0.00	1,000.00
tblLandUse	LandUseSquareFeet	192,000.00	251,828.00
tblLandUse	LandUseSquareFeet	4,320.00	4,323.00
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Excavators

tblProjectCharacteristics	CO2IntensityFactor	641.35	123
tblTripsAndVMT	HaulingTripNumber	250.00	0.00
tblTripsAndVMT	VendorTripNumber	36.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	177.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblTripsAndVMT	WorkerTripNumber	35.00	0.00
tblVehicleEF	HHD	0.19	0.03
tblVehicleEF	HHD	0.09	0.09
tblVehicleEF	HHD	0.06	1.0000e-006
tblVehicleEF	HHD	1.28	5.99
tblVehicleEF	HHD	1.32	0.60
tblVehicleEF	HHD	5.60	0.02
tblVehicleEF	HHD	3,390.24	902.77
tblVehicleEF	HHD	1,532.40	1,280.13
tblVehicleEF	HHD	16.95	0.20
tblVehicleEF	HHD	11.48	5.20
tblVehicleEF	HHD	1.69	2.61
tblVehicleEF	HHD	18.57	2.50
tblVehicleEF	HHD	5.7650e-003	2.5680e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.8880e-003	0.02
tblVehicleEF	HHD	1.8800e-004	2.0000e-006
tblVehicleEF	HHD	5.5150e-003	2.4570e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.7510e-003	8.8560e-003

tblVehicleEF	HHD	5.6330e-003	0.02
tblVehicleEF	HHD	1.7300e-004	1.0000e-006
tblVehicleEF	HHD	1.2300e-004	6.0000e-006
tblVehicleEF	HHD	6.5160e-003	2.7700e-004
tblVehicleEF	HHD	0.32	0.40
tblVehicleEF	HHD	8.6000e-005	4.0000e-006
tblVehicleEF	HHD	0.08	0.03
tblVehicleEF	HHD	8.4000e-004	1.4630e-003
tblVehicleEF	HHD	0.10	5.0000e-006
tblVehicleEF	HHD	0.03	8.2840e-003
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	2.6000e-004	2.0000e-006
tblVehicleEF	HHD	1.2300e-004	6.0000e-006
tblVehicleEF	HHD	6.5160e-003	2.7700e-004
tblVehicleEF	HHD	0.38	0.46
tblVehicleEF	HHD	8.6000e-005	4.0000e-006
tblVehicleEF	HHD	0.18	0.12
tblVehicleEF	HHD	8.4000e-004	1.4630e-003
tblVehicleEF	HHD	0.11	5.0000e-006
tblVehicleEF	LDA	2.0150e-003	1.0620e-003
tblVehicleEF	LDA	2.4220e-003	0.03
tblVehicleEF	LDA	0.32	0.40
tblVehicleEF	LDA	0.69	1.76
tblVehicleEF	LDA	188.24	216.84
tblVehicleEF	LDA	42.70	45.31
tblVehicleEF	LDA	0.03	0.02
tblVehicleEF	LDA	0.03	0.13
tblVehicleEF	LDA	1.2060e-003	9.7000e-004
tblVehicleEF	LDA	1.8610e-003	1.2920e-003
tblVehicleEF	LDA	1.1100e-003	8.9300e-004

tblVehicleEF	LDA	1.7110e-003	1.1880e-003
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	0.06	0.07
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	5.0570e-003	3.8200e-003
tblVehicleEF	LDA	0.03	0.18
tblVehicleEF	LDA	0.03	0.13
tblVehicleEF	LDA	1.8830e-003	1.1500e-004
tblVehicleEF	LDA	4.3800e-004	0.00
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	0.06	0.07
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	7.3530e-003	5.5430e-003
tblVehicleEF	LDA	0.03	0.18
tblVehicleEF	LDA	0.04	0.14
tblVehicleEF	LDT1	3.4500e-003	1.6350e-003
tblVehicleEF	LDT1	5.3100e-003	0.04
tblVehicleEF	LDT1	0.48	0.50
tblVehicleEF	LDT1	1.27	1.94
tblVehicleEF	LDT1	239.93	265.78
tblVehicleEF	LDT1	55.58	56.39
tblVehicleEF	LDT1	0.05	0.03
tblVehicleEF	LDT1	0.06	0.17
tblVehicleEF	LDT1	1.4450e-003	1.1100e-003
tblVehicleEF	LDT1	2.2370e-003	1.5310e-003
tblVehicleEF	LDT1	1.3290e-003	1.0210e-003
tblVehicleEF	LDT1	2.0570e-003	1.4080e-003
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.13	0.11
tblVehicleEF	LDT1	0.04	0.05

tblVehicleEF	LDT1	8.5490e-003	6.3800e-003
tblVehicleEF	LDT1	0.10	0.43
tblVehicleEF	LDT1	0.07	0.18
tblVehicleEF	LDT1	2.4030e-003	2.7630e-003
tblVehicleEF	LDT1	5.7700e-004	0.00
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.13	0.11
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.01	9.3080e-003
tblVehicleEF	LDT1	0.10	0.43
tblVehicleEF	LDT1	0.08	0.19
tblVehicleEF	LDT2	2.9140e-003	1.6330e-003
tblVehicleEF	LDT2	3.4120e-003	0.04
tblVehicleEF	LDT2	0.44	0.50
tblVehicleEF	LDT2	0.94	2.37
tblVehicleEF	LDT2	271.33	274.95
tblVehicleEF	LDT2	61.80	58.54
tblVehicleEF	LDT2	0.04	0.03
tblVehicleEF	LDT2	0.05	0.18
tblVehicleEF	LDT2	1.3310e-003	1.0750e-003
tblVehicleEF	LDT2	2.0380e-003	1.3750e-003
tblVehicleEF	LDT2	1.2240e-003	9.9100e-004
tblVehicleEF	LDT2	1.8740e-003	1.2650e-003
tblVehicleEF	LDT2	0.03	0.05
tblVehicleEF	LDT2	0.07	0.10
tblVehicleEF	LDT2	0.03	0.05
tblVehicleEF	LDT2	7.2400e-003	6.1350e-003
tblVehicleEF	LDT2	0.06	0.37
tblVehicleEF	LDT2	0.05	0.19
tblVehicleEF	LDT2	2.7150e-003	0.01

tblVehicleEF	LDT2	6.3300e-004	1.1700e-004
tblVehicleEF	LDT2	0.03	0.05
tblVehicleEF	LDT2	0.07	0.10
tblVehicleEF	LDT2	0.03	0.05
tblVehicleEF	LDT2	0.01	8.9040e-003
tblVehicleEF	LDT2	0.06	0.37
tblVehicleEF	LDT2	0.05	0.21
tblVehicleEF	LHD1	3.9010e-003	4.1040e-003
tblVehicleEF	LHD1	9.8130e-003	5.7980e-003
tblVehicleEF	LHD1	0.01	9.4380e-003
tblVehicleEF	LHD1	0.13	0.17
tblVehicleEF	LHD1	0.70	0.54
tblVehicleEF	LHD1	1.75	0.90
tblVehicleEF	LHD1	9.04	8.42
tblVehicleEF	LHD1	642.36	702.31
tblVehicleEF	LHD1	26.02	9.91
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.72	0.42
tblVehicleEF	LHD1	0.68	0.23
tblVehicleEF	LHD1	8.5500e-004	9.5000e-004
tblVehicleEF	LHD1	0.01	9.9460e-003
tblVehicleEF	LHD1	0.01	8.3880e-003
tblVehicleEF	LHD1	6.9900e-004	2.1700e-004
tblVehicleEF	LHD1	8.1800e-004	9.0900e-004
tblVehicleEF	LHD1	2.6120e-003	2.4860e-003
tblVehicleEF	LHD1	0.01	7.9800e-003
tblVehicleEF	LHD1	6.4300e-004	1.9900e-004
tblVehicleEF	LHD1	1.7130e-003	1.3380e-003
tblVehicleEF	LHD1	0.09	0.06
tblVehicleEF	LHD1	0.01	0.02

tblVehicleEF	LHD1	1.0320e-003	8.1000e-004
tblVehicleEF	LHD1	0.11	0.08
tblVehicleEF	LHD1	0.31	0.53
tblVehicleEF	LHD1	0.16	0.05
tblVehicleEF	LHD1	9.0000e-005	8.2000e-005
tblVehicleEF	LHD1	6.2740e-003	6.8450e-003
tblVehicleEF	LHD1	2.9200e-004	9.8000e-005
tblVehicleEF	LHD1	1.7130e-003	1.3380e-003
tblVehicleEF	LHD1	0.09	0.06
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.0320e-003	8.1000e-004
tblVehicleEF	LHD1	0.12	0.09
tblVehicleEF	LHD1	0.31	0.53
tblVehicleEF	LHD1	0.17	0.05
tblVehicleEF	LHD2	2.5500e-003	2.6050e-003
tblVehicleEF	LHD2	5.3040e-003	5.3800e-003
tblVehicleEF	LHD2	3.2900e-003	5.2060e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.46	0.50
tblVehicleEF	LHD2	0.89	0.50
tblVehicleEF	LHD2	13.64	13.04
tblVehicleEF	LHD2	676.45	686.56
tblVehicleEF	LHD2	21.82	6.64
tblVehicleEF	LHD2	0.07	0.08
tblVehicleEF	LHD2	0.22	0.39
tblVehicleEF	LHD2	0.27	0.14
tblVehicleEF	LHD2	1.0530e-003	1.4770e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.4570e-003	0.01
tblVehicleEF	LHD2	3.7000e-004	1.0600e-004

tblVehicleEF	LHD2	1.0070e-003	1.4130e-003
tblVehicleEF	LHD2	2.7080e-003	2.7070e-003
tblVehicleEF	LHD2	9.0240e-003	0.01
tblVehicleEF	LHD2	3.4000e-004	9.8000e-005
tblVehicleEF	LHD2	4.4100e-004	5.8900e-004
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	2.9700e-004	3.8800e-004
tblVehicleEF	LHD2	0.09	0.10
tblVehicleEF	LHD2	0.04	0.15
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	1.3300e-004	1.2500e-004
tblVehicleEF	LHD2	6.5720e-003	6.6240e-003
tblVehicleEF	LHD2	2.3300e-004	6.6000e-005
tblVehicleEF	LHD2	4.4100e-004	5.8900e-004
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	2.9700e-004	3.8800e-004
tblVehicleEF	LHD2	0.11	0.11
tblVehicleEF	LHD2	0.04	0.15
tblVehicleEF	LHD2	0.05	0.03
tblVehicleEF	MCY	0.48	0.33
tblVehicleEF	MCY	0.16	0.25
tblVehicleEF	MCY	19.06	19.24
tblVehicleEF	MCY	10.45	9.31
tblVehicleEF	MCY	178.62	217.21
tblVehicleEF	MCY	43.41	60.17
tblVehicleEF	MCY	1.17	1.17
tblVehicleEF	MCY	0.32	0.27
tblVehicleEF	MCY	2.2460e-003	2.2210e-003

tblVehicleEF	MCY	3.3740e-003	2.9170e-003
tblVehicleEF	MCY	2.0960e-003	2.0720e-003
tblVehicleEF	MCY	3.1600e-003	2.7320e-003
tblVehicleEF	MCY	0.74	1.53
tblVehicleEF	MCY	0.63	0.66
tblVehicleEF	MCY	0.43	0.91
tblVehicleEF	MCY	2.24	2.25
tblVehicleEF	MCY	0.50	1.63
tblVehicleEF	MCY	2.17	1.94
tblVehicleEF	MCY	2.1640e-003	2.1490e-003
tblVehicleEF	MCY	6.6900e-004	5.9500e-004
tblVehicleEF	MCY	0.74	1.53
tblVehicleEF	MCY	0.63	0.66
tblVehicleEF	MCY	0.43	0.91
tblVehicleEF	MCY	2.80	2.81
tblVehicleEF	MCY	0.50	1.63
tblVehicleEF	MCY	2.36	2.11
tblVehicleEF	MDV	4.3350e-003	1.7060e-003
tblVehicleEF	MDV	7.1620e-003	0.04
tblVehicleEF	MDV	0.56	0.50
tblVehicleEF	MDV	1.52	2.37
tblVehicleEF	MDV	364.83	331.60
tblVehicleEF	MDV	82.85	68.43
tblVehicleEF	MDV	0.06	0.03
tblVehicleEF	MDV	0.11	0.18
tblVehicleEF	MDV	1.3730e-003	1.0950e-003
tblVehicleEF	MDV	2.0630e-003	1.3530e-003
tblVehicleEF	MDV	1.2650e-003	1.0100e-003
tblVehicleEF	MDV	1.8970e-003	1.2440e-003
tblVehicleEF	MDV	0.05	0.05

tblVehicleEF	MDV	0.13	0.10
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.01	6.6540e-003
tblVehicleEF	MDV	0.09	0.36
tblVehicleEF	MDV	0.10	0.20
tblVehicleEF	MDV	3.6470e-003	3.0610e-003
tblVehicleEF	MDV	8.5400e-004	6.3300e-004
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.13	0.10
tblVehicleEF	MDV	0.05	0.06
tblVehicleEF	MDV	0.02	9.6130e-003
tblVehicleEF	MDV	0.09	0.36
tblVehicleEF	MDV	0.11	0.22
tblVehicleEF	MH	7.7730e-003	5.1140e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	0.42	0.32
tblVehicleEF	MH	3.61	1.59
tblVehicleEF	MH	1,181.48	1,340.95
tblVehicleEF	MH	55.62	14.88
tblVehicleEF	MH	0.88	1.14
tblVehicleEF	MH	0.61	0.22
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	8.5300e-004	2.0500e-004
tblVehicleEF	MH	3.2320e-003	3.3160e-003
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.8400e-004	1.8800e-004
tblVehicleEF	MH	0.36	0.29
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	0.16	0.12

tblVehicleEF	MH	0.04	0.04
tblVehicleEF	MH	9.1240e-003	0.52
tblVehicleEF	MH	0.21	0.07
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.1900e-004	1.4700e-004
tblVehicleEF	MH	0.36	0.29
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	0.16	0.12
tblVehicleEF	MH	0.05	0.05
tblVehicleEF	MH	9.1240e-003	0.52
tblVehicleEF	MH	0.23	0.08
tblVehicleEF	MHD	0.02	5.1880e-003
tblVehicleEF	MHD	3.0630e-003	1.4320e-003
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.40	0.55
tblVehicleEF	MHD	0.26	0.18
tblVehicleEF	MHD	4.29	1.24
tblVehicleEF	MHD	119.84	91.23
tblVehicleEF	MHD	1,171.46	1,045.93
tblVehicleEF	MHD	65.42	11.83
tblVehicleEF	MHD	0.32	0.52
tblVehicleEF	MHD	1.01	1.37
tblVehicleEF	MHD	8.99	1.54
tblVehicleEF	MHD	7.5000e-005	2.6600e-004
tblVehicleEF	MHD	3.0430e-003	6.6940e-003
tblVehicleEF	MHD	8.6600e-004	1.4600e-004
tblVehicleEF	MHD	7.2000e-005	2.5500e-004
tblVehicleEF	MHD	2.9020e-003	6.3940e-003
tblVehicleEF	MHD	7.9600e-004	1.3400e-004
tblVehicleEF	MHD	6.5200e-004	3.7100e-004

tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	4.4100e-004	2.4700e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.02	0.11
tblVehicleEF	MHD	0.27	0.06
tblVehicleEF	MHD	1.1570e-003	8.6600e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.2900e-004	1.1700e-004
tblVehicleEF	MHD	6.5200e-004	3.7100e-004
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	4.4100e-004	2.4700e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.02	0.11
tblVehicleEF	MHD	0.29	0.06
tblVehicleEF	OBUS	0.01	8.8240e-003
tblVehicleEF	OBUS	4.9730e-003	3.7480e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.24	0.56
tblVehicleEF	OBUS	0.34	0.40
tblVehicleEF	OBUS	4.67	2.28
tblVehicleEF	OBUS	86.30	72.05
tblVehicleEF	OBUS	1,266.16	1,322.84
tblVehicleEF	OBUS	67.15	18.99
tblVehicleEF	OBUS	0.18	0.29
tblVehicleEF	OBUS	0.76	1.02
tblVehicleEF	OBUS	2.31	0.73
tblVehicleEF	OBUS	1.6000e-005	9.9000e-005
tblVehicleEF	OBUS	2.6160e-003	6.4490e-003

tblVehicleEF	OBUS	9.4400e-004	2.0600e-004
tblVehicleEF	OBUS	1.6000e-005	9.4000e-005
tblVehicleEF	OBUS	2.4770e-003	6.1460e-003
tblVehicleEF	OBUS	8.6800e-004	1.8900e-004
tblVehicleEF	OBUS	1.2330e-003	1.3950e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	6.0900e-004	7.0700e-004
tblVehicleEF	OBUS	0.04	0.02
tblVehicleEF	OBUS	0.06	0.30
tblVehicleEF	OBUS	0.29	0.11
tblVehicleEF	OBUS	8.3500e-004	6.8700e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.5300e-004	1.8800e-004
tblVehicleEF	OBUS	1.2330e-003	1.3950e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	6.0900e-004	7.0700e-004
tblVehicleEF	OBUS	0.05	0.03
tblVehicleEF	OBUS	0.06	0.30
tblVehicleEF	OBUS	0.32	0.12
tblVehicleEF	SBUS	0.82	0.07
tblVehicleEF	SBUS	5.6820e-003	5.4620e-003
tblVehicleEF	SBUS	0.05	6.1350e-003
tblVehicleEF	SBUS	7.29	2.84
tblVehicleEF	SBUS	0.38	0.47
tblVehicleEF	SBUS	5.73	0.88
tblVehicleEF	SBUS	1,106.25	329.06
tblVehicleEF	SBUS	1,059.21	945.39
tblVehicleEF	SBUS	49.57	4.89

tblVehicleEF	SBUS	5.18	3.05
tblVehicleEF	SBUS	1.91	3.70
tblVehicleEF	SBUS	12.65	1.09
tblVehicleEF	SBUS	2.6220e-003	2.6460e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	9.5620e-003	0.02
tblVehicleEF	SBUS	9.7900e-004	7.8000e-005
tblVehicleEF	SBUS	2.5090e-003	2.5320e-003
tblVehicleEF	SBUS	2.6720e-003	2.6600e-003
tblVehicleEF	SBUS	9.1310e-003	0.02
tblVehicleEF	SBUS	9.0000e-004	7.2000e-005
tblVehicleEF	SBUS	2.1580e-003	5.9400e-004
tblVehicleEF	SBUS	0.02	6.7130e-003
tblVehicleEF	SBUS	0.87	0.31
tblVehicleEF	SBUS	1.0980e-003	3.0300e-004
tblVehicleEF	SBUS	0.07	0.07
tblVehicleEF	SBUS	0.01	0.04
tblVehicleEF	SBUS	0.29	0.03
tblVehicleEF	SBUS	0.01	3.1380e-003
tblVehicleEF	SBUS	0.01	9.0510e-003
tblVehicleEF	SBUS	5.9400e-004	4.8000e-005
tblVehicleEF	SBUS	2.1580e-003	5.9400e-004
tblVehicleEF	SBUS	0.02	6.7130e-003
tblVehicleEF	SBUS	1.25	0.45
tblVehicleEF	SBUS	1.0980e-003	3.0300e-004
tblVehicleEF	SBUS	0.08	0.08
tblVehicleEF	SBUS	0.01	0.04
tblVehicleEF	SBUS	0.32	0.04
tblVehicleEF	UBUS	0.25	0.83
tblVehicleEF	UBUS	0.04	0.03

tblVehicleEF	UBUS	3.97	6.40
tblVehicleEF	UBUS	6.04	2.39
tblVehicleEF	UBUS	2,058.31	1,671.51
tblVehicleEF	UBUS	96.26	22.73
tblVehicleEF	UBUS	8.43	0.46
tblVehicleEF	UBUS	15.02	0.23
tblVehicleEF	UBUS	0.61	0.11
tblVehicleEF	UBUS	0.01	0.02
tblVehicleEF	UBUS	0.17	3.5750e-003
tblVehicleEF	UBUS	9.7700e-004	2.8000e-004
tblVehicleEF	UBUS	0.26	0.05
tblVehicleEF	UBUS	3.0000e-003	5.0890e-003
tblVehicleEF	UBUS	0.17	3.3750e-003
tblVehicleEF	UBUS	8.9800e-004	2.5800e-004
tblVehicleEF	UBUS	1.9760e-003	6.4600e-004
tblVehicleEF	UBUS	0.03	8.4650e-003
tblVehicleEF	UBUS	1.2990e-003	3.9000e-004
tblVehicleEF	UBUS	0.43	0.02
tblVehicleEF	UBUS	9.2280e-003	0.04
tblVehicleEF	UBUS	0.53	0.13
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.0730e-003	2.2500e-004
tblVehicleEF	UBUS	1.9760e-003	6.4600e-004
tblVehicleEF	UBUS	0.03	8.4650e-003
tblVehicleEF	UBUS	1.2990e-003	3.9000e-004
tblVehicleEF	UBUS	0.72	0.86
tblVehicleEF	UBUS	9.2280e-003	0.04
tblVehicleEF	UBUS	0.58	0.14
tblVehicleTrips	CC_TL	7.30	2.00
tblVehicleTrips	DV_TP	15.00	0.00

tblVehicleTrips	PB_TP	61.00	0.00
tblVehicleTrips	PR_TP	24.00	100.00
tblVehicleTrips	ST_TR	6.39	5.23
tblVehicleTrips	ST_TR	863.10	191.46
tblVehicleTrips	SU_TR	5.86	4.79
tblVehicleTrips	SU_TR	758.45	168.24
tblVehicleTrips	WD_TR	6.65	5.44
tblVehicleTrips	WD_TR	737.99	163.71
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	582.40	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

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

Category	tons/yr										MT/yr					
Area	1.2311	0.0230	1.4268	1.2000e-004		8.4500e-003	8.4500e-003		8.4500e-003	8.4500e-003	0.0000	10.0029	10.0029	2.3800e-003	1.4000e-004	10.1042
Energy	9.1500e-003	0.0782	0.0337	5.0000e-004		6.3200e-003	6.3200e-003		6.3200e-003	6.3200e-003	0.0000	161.0423	161.0423	0.0184	5.1000e-003	163.0212
Mobile	0.7569	0.6059	4.9213	0.0108	1.1659	6.7900e-003	1.1727	0.3116	6.3300e-003	0.3179	0.0000	939.8012	939.8012	0.0650	0.0000	941.4249
Waste						0.0000	0.0000		0.0000	0.0000	20.5630	0.0000	20.5630	1.2152	0.0000	50.9439
Water						0.0000	0.0000		0.0000	0.0000	4.5391	5.4514	9.9905	0.0169	0.0101	13.4341
Total	**1.9972**	**0.7072**	**6.3817**	**0.0114**	**1.1659**	**0.0216**	**1.1875**	**0.3116**	**0.0211**	**0.3327**	**25.1021**	**1,116.2978**	**1,141.3999**	**1.3178**	**0.0154**	**1,178.9283**

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	1.2311	0.0230	1.4268	1.2000e-004		8.4500e-003	8.4500e-003		8.4500e-003	8.4500e-003	0.0000	10.0029	10.0029	2.3800e-003	1.4000e-004	10.1042
Energy	9.1500e-003	0.0782	0.0337	5.0000e-004		6.3200e-003	6.3200e-003		6.3200e-003	6.3200e-003	0.0000	161.0423	161.0423	0.0184	5.1000e-003	163.0212
Mobile	0.7569	0.6059	4.9213	0.0108	1.1659	6.7900e-003	1.1727	0.3116	6.3300e-003	0.3179	0.0000	939.8012	939.8012	0.0650	0.0000	941.4249
Waste						0.0000	0.0000		0.0000	0.0000	20.5630	0.0000	20.5630	1.2152	0.0000	50.9439
Water						0.0000	0.0000		0.0000	0.0000	4.5391	5.4514	9.9905	0.0169	0.0101	13.4341
Total	**1.9972**	**0.7072**	**6.3817**	**0.0114**	**1.1659**	**0.0216**	**1.1875**	**0.3116**	**0.0211**	**0.3327**	**25.1021**	**1,116.2978**	**1,141.3999**	**1.3178**	**0.0154**	**1,178.9283**

	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**

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					
Mitigated	0.7569	0.6059	4.9213	0.0108	1.1659	6.7900e-003	1.1727	0.3116	6.3300e-003	0.3179	0.0000	939.8012	939.8012	0.0650	0.0000	941.4249
Unmitigated	0.7569	0.6059	4.9213	0.0108	1.1659	6.7900e-003	1.1727	0.3116	6.3300e-003	0.3179	0.0000	939.8012	939.8012	0.0650	0.0000	941.4249

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,044.48	1,004.16	919.68	2,357,858	2,357,858
Convenience Market (24 Hour)	707.23	827.11	726.80	813,765	813,765
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	1,751.71	1,831.27	1,646.48	3,171,623	3,171,623

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Convenience Market (24 Hour)	9.50	2.00	7.30	0.90	80.10	19.00	100	0	0
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.548735	0.059639	0.189953	0.116598	0.024933	0.006381	0.010873	0.011469	0.001123	0.000744	0.027916	0.000814	0.000822
Convenience Market (24 Hour)	0.548735	0.059639	0.189953	0.116598	0.024933	0.006381	0.010873	0.011469	0.001123	0.000744	0.027916	0.000814	0.000822
Enclosed Parking with Elevator	0.548735	0.059639	0.189953	0.116598	0.024933	0.006381	0.010873	0.011469	0.001123	0.000744	0.027916	0.000814	0.000822
Parking Lot	0.548735	0.059639	0.189953	0.116598	0.024933	0.006381	0.010873	0.011469	0.001123	0.000744	0.027916	0.000814	0.000822

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	70.5305	70.5305	0.0166	3.4400e-003	71.9715
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	70.5305	70.5305	0.0166	3.4400e-003	71.9715
NaturalGas Mitigated	9.1500e-003	0.0782	0.0337	5.0000e-004		6.3200e-003	6.3200e-003		6.3200e-003	6.3200e-003	0.0000	90.5119	90.5119	1.7300e-003	1.6600e-003	91.0497
NaturalGas Unmitigated	9.1500e-003	0.0782	0.0337	5.0000e-004		6.3200e-003	6.3200e-003		6.3200e-003	6.3200e-003	0.0000	90.5119	90.5119	1.7300e-003	1.6600e-003	91.0497

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					
Apartments Mid Rise	1.67624e+006	9.0400e-003	0.0772	0.0329	4.9000e-004		6.2400e-003	6.2400e-003		6.2400e-003	6.2400e-003	0.0000	89.4507	89.4507	1.7100e-003	1.6400e-003	89.9823
Convenience Market (24 Hour)	19885.8	1.1000e-004	9.7000e-004	8.2000e-004	1.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	1.0612	1.0612	2.0000e-005	2.0000e-005	1.0675
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**9.1500e-003**	**0.0782**	**0.0337**	**5.0000e-004**		**6.3100e-003**	**6.3100e-003**		**6.3100e-003**	**6.3100e-003**	**0.0000**	**90.5119**	**90.5119**	**1.7300e-003**	**1.6600e-003**	**91.0497**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	1.67624e+006	9.0400e-003	0.0772	0.0329	4.9000e-004		6.2400e-003	6.2400e-003		6.2400e-003	6.2400e-003	0.0000	89.4507	89.4507	1.7100e-003	1.6400e-003	89.9823
Convenience Market (24 Hour)	19885.8	1.1000e-004	9.7000e-004	8.2000e-004	1.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	1.0612	1.0612	2.0000e-005	2.0000e-005	1.0675
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**9.1500e-003**	**0.0782**	**0.0337**	**5.0000e-004**		**6.3100e-003**	**6.3100e-003**		**6.3100e-003**	**6.3100e-003**	**0.0000**	**90.5119**	**90.5119**	**1.7300e-003**	**1.6600e-003**	**91.0497**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			

Apartments Mid Rise	810622	45.2261	0.0107	2.2100e-003	46.1501
Convenience Market (24 Hour)	45305	2.5277	6.0000e-004	1.2000e-004	2.5793
Enclosed Parking with Elevator	400824	22.3627	5.2700e-003	1.0900e-003	22.8196
Parking Lot	7420	0.4140	1.0000e-004	2.0000e-005	0.4224
Total		**70.5305**	**0.0166**	**3.4400e-003**	**71.9715**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	810622	45.2261	0.0107	2.2100e-003	46.1501
Convenience Market (24 Hour)	45305	2.5277	6.0000e-004	1.2000e-004	2.5793
Enclosed Parking with Elevator	400824	22.3627	5.2700e-003	1.0900e-003	22.8196
Parking Lot	7420	0.4140	1.0000e-004	2.0000e-005	0.4224
Total		**70.5305**	**0.0166**	**3.4400e-003**	**71.9715**

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	1.2311	0.0230	1.4268	1.2000e-004		8.4500e-003	8.4500e-003		8.4500e-003	8.4500e-003	0.0000	10.0029	10.0029	2.3800e-003	1.4000e-004	10.1042
Unmitigated	1.2311	0.0230	1.4268	1.2000e-004		8.4500e-003	8.4500e-003		8.4500e-003	8.4500e-003	0.0000	10.0029	10.0029	2.3800e-003	1.4000e-004	10.1042

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1814					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0062					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.8000e-004	6.6200e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.6701	7.6701	1.5000e-004	1.4000e-004	7.7157
Landscaping	0.0427	0.0164	1.4239	8.0000e-005		7.9100e-003	7.9100e-003		7.9100e-003	7.9100e-003	0.0000	2.3328	2.3328	2.2300e-003	0.0000	2.3885
Total	**1.2311**	**0.0230**	**1.4268**	**1.2000e-004**		**8.4500e-003**	**8.4500e-003**		**8.4500e-003**	**8.4500e-003**	**0.0000**	**10.0029**	**10.0029**	**2.3800e-003**	**1.4000e-004**	**10.1043**

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	0.1814					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0062					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.8000e-004	6.6200e-003	2.8200e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.6701	7.6701	1.5000e-004	1.4000e-004	7.7157	
Landscaping	0.0427	0.0164	1.4239	8.0000e-005		7.9100e-003	7.9100e-003		7.9100e-003	7.9100e-003	0.0000	2.3328	2.3328	2.2300e-003	0.0000	2.3885	
Total	**1.2311**	**0.0230**	**1.4268**	**1.2000e-004**		**8.4500e-003**	**8.4500e-003**		**8.4500e-003**	**8.4500e-003**	**0.0000**	**10.0029**	**10.0029**	**2.3800e-003**	**1.4000e-004**	**10.1043**	

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	9.9905	0.0169	0.0101	13.4341
Unmitigated	9.9905	0.0169	0.0101	13.4341

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	12.5096 / 7.88647	9.7424	0.0165	9.8800e-003	13.1001

Convenience Market (24 Hour)	0.319993 / 0.196125	0.2481	4.2000e-004	2.5000e-004	0.3340
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**9.9905**	**0.0169**	**0.0101**	**13.4341**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	12.5096 / 7.88647	9.7424	0.0165	9.8800e-003	13.1001
Convenience Market (24 Hour)	0.319993 / 0.196125	0.2481	4.2000e-004	2.5000e-004	0.3340
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**9.9905**	**0.0169**	**0.0101**	**13.4341**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e

	MT/yr			
Mitigated	20.5630	1.2152	0.0000	50.9439
Unmitigated	20.5630	1.2152	0.0000	50.9439

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	88.32	17.9282	1.0595	0.0000	44.4163
Convenience Market (24 Hour)	12.98	2.6348	0.1557	0.0000	6.5277
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**20.5630**	**1.2152**	**0.0000**	**50.9439**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	88.32	17.9282	1.0595	0.0000	44.4163
Convenience Market (24 Hour)	12.98	2.6348	0.1557	0.0000	6.5277

Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**20.5630**	**1.2152**	**0.0000**	**50.9439**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 3: EMFAC2017 Calculations

Summary of Construction Traffic Emissions (EMFAC2017)

Pollutants YEAR	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	NBio- CO2
					Tons						*Metric Tons*
Criteria Pollutants											
2021	0.0531	0.3181	0.4973	0.0023	0.1428	0.0308	0.1736	0.0215	0.0148	0.0363	199.7354
2022	0.0106	0.0632	0.1056	0.0005	0.0331	0.0067	0.0399	0.0050	0.0030	0.0080	45.1738
Toxic Air Contaminants (1 Mile Trip Length)											
2021	0.0391	0.0877	0.1683	0.0003	0.0140	0.0034	0.0174	0.0021	0.0017	0.0038	27.9797
2022	0.0084	0.0191	0.0376	0.0001	0.0032	0.0007	0.0040	0.0005	0.0003	0.0008	6.3708

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	15	0	300	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	3240	0	0
Site Preparation	18	0	180	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	1944	0	0
Grading	15	0	300	0	250	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	3240	0	5000
Trenching	5	0	50	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	540	0	0
Building Construction	178	36	40940	8280	729	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	442152	60444	5321.7
Architectural Coating	36	0	720	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT	7776	0	0
Paving	15	0	300	0	138	10.8	7.3	7.3	LD_Mix	HDT_Mix	HHDT	3240	0	1007.4

Number of Days Per Year					
2021	1/4/21	12/31/21	362	**260**	
2022	1/1/22	3/25/22	84	**60**	
			446	**320**	***Total Workdays***

Phase	Start Date	End Date	Days/Week	Workdays
Demolition	1/4/2021	1/29/2021	5	20
Site Preparation	1/30/2021	2/12/2021	5	10
Grading	2/13/2021	3/12/2021	5	20
Trenching	2/13/2021	2/26/2021	5	10
Building Construction	3/13/2021	1/28/2022	5	230
Architectural Coating	1/29/2022	2/25/2022	5	20
Paving	2/26/2022	3/25/2022	5	20

CalEEMod EMFAC2017 Emission Factors Input — Year 2023

Season	EmissionType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
A	CH4_IDLEX	0	0	0	0	0.004922	0.003301	0.005155	0.028415027	0.009312	0	0	0.047346	0
A	CH4_RUNEX	0.002214	0.004155	0.003062	0.00362	0.009733	0.007245	0.003411	0.099109472	0.008072	0.428446	0.344974	0.008829	0.010406
A	CH4_STREX	0.050612	0.070539	0.067932	0.07587	0.014958	0.009035	0.014633	1.03387E-06	0.025693	0.033779	0.26269	0.004703	0.022108
A	CO_IDLEX	0	0	0	0	0.178803	0.140888	0.526001	5.973875245	0.494632	0	0	1.959185	0
A	CO_RUNEX	0.55851	0.888611	0.698744	0.75891	0.906362	0.64752	0.4234	0.653777183	0.865002	3.293841	21.09046	0.787432	1.024673
A	CO_STREX	2.23962	2.485134	2.840887	3.099339	1.077037	0.668286	1.767597	0.026132994	2.793842	2.388649	9.102345	0.727378	2.048552
A	CO2_NBIO_IDLEX	0	0	0	0	9.116455	13.94199	98.88231	1035.145964	62.76646	0	0	345.6402	0
A	CO2_NBIO_RUNEX	249.9134	302.664	325.3651	393.0994	789.2623	776.6887	1160.601	1510.829081	1557.634	1810.089	218.2252	1061.233	1506.765
A	CO2_NBIO_STREX	52.25803	64.45921	69.02635	81.3776	11.27458	8.180631	14.20435	0.279445655	22.39168	26.71079	62.23681	3.745577	17.63106
A	NOX_IDLEX	0	0	0	0	0.0681	0.096988	0.66949	5.669824783	0.215506	0	0	4.162629	0
A	NOX_RUNEX	0.038485	0.080667	0.063645	0.077247	0.964441	0.848429	1.455049	2.985356519	0.966588	0.497685	1.189892	6.274504	1.488739
A	NOX_STREX	0.185545	0.258763	0.27616	0.312286	0.308804	0.19747	1.489219	2.374491941	0.60851	0.260684	0.275576	0.597467	0.230129
A	PM10_IDLEX	0	0	0	0	0.000905	0.001377	0.000616	0.004173924	7.3E-05	0	0	0.004801	0
A	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.08918	0.13034	0.060740458	0.13034	0.105346	0.01176	0.7448	0.13034
A	PM10_PMTW	0.008	0.008	0.008	0.008	0.009851	0.010713	0.012	0.035361325	0.012	0.020357	0.004	0.010916	0.013234
A	PM10_RUNEX	0.001513	0.001786	0.001433	0.001579	0.01261	0.015189	0.006852	0.024328594	0.005472	0.003389	0.002105	0.03662	0.028626
A	PM10_STREX	0.001815	0.002366	0.001762	0.001857	0.000266	0.000135	0.00017	1.60771E-06	0.000194	0.000206	0.003454	5.5E-05	0.000256
A	PM25_IDLEX	0	0	0	0	0.000866	0.001318	0.000589	0.003993362	6.99E-05	0	0	0.004594	0
A	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.03822	0.05586	0.026031625	0.05586	0.045148	0.00504	0.3192	0.05586
A	PM25_PMTW	0.002	0.002	0.002	0.002	0.002463	0.002678	0.003	0.008840331	0.003	0.005089	0.001	0.002729	0.003309
A	PM25_RUNEX	0.001396	0.001644	0.00132	0.001459	0.012015	0.014506	0.006545	0.023276055	0.005211	0.00321	0.001971	0.035018	0.027344
A	PM25_STREX	0.001669	0.002175	0.00162	0.001708	0.000245	0.000124	0.000156	1.47823E-06	0.000179	0.000189	0.003258	5.05E-05	0.000235
A	ROG_DIURN	0.03898	0.085542	0.056224	0.060824	0.001838	0.000953	0.000581	5.86565E-06	0.001277	0.001141	1.580476	0.00046	0.56352
A	ROG_HTSK	0.100943	0.188256	0.124903	0.132019	0.079407	0.04242	0.03175	0.000259466	0.023382	0.017073	0.770323	0.005606	0.054355
A	ROG_IDLEX	0	0	0	0	0.020793	0.016321	0.025888	0.406179798	0.047559	0	0	0.222478	0
A	ROG_RESTL	0.037382	0.076528	0.058617	0.064575	0.001032	0.000553	0.000341	3.62263E-06	0.000631	0.000754	0.968804	0.000189	0.214781
A	ROG_RUNEX	0.008923	0.018034	0.012361	0.015316	0.106635	0.11091	0.024609	0.030178574	0.041824	0.017401	2.358588	0.109883	0.070413
A	ROG_RUNLS	0.217436	0.698567	0.447616	0.443257	0.592941	0.267678	0.189828	0.001328541	0.26747	0.103205	2.436421	0.037169	1.327542
A	ROG_STREX	0.231963	0.354682	0.318363	0.373321	0.076189	0.045189	0.079114	5.40226E-06	0.131749	0.14273	2.023258	0.027218	0.092565
A	SO2_IDLEX	0	0	0	0	8.83E-05	0.000133	0.000939	0.009491388	0.0006	0	0	0.003287	0
A	SO2_RUNEX	0.000146	0.002958	0.01112	0.003835	0.007699	0.007504	0.01112	0.013433001	0.015208	0.016401	0.00216	0.010128	0.014772
A	SO2_STREX	0	0	0.000141	0.000795	0.000112	8.1E-05	0.000141	2.76534E-06	0.000222	0.000264	0.000616	3.71E-05	0.000174
A	TOG_DIURN	0.03898	0.085542	0.056224	0.060824	0.001838	0.000953	0.000581	5.86565E-06	0.001277	0.001141	1.580476	0.00046	0.56352
A	TOG_HTSK	0.100943	0.188256	0.124903	0.132019	0.079407	0.04242	0.03175	0.000259466	0.023382	0.017073	0.770323	0.005606	0.054355
A	TOG_IDLEX	0	0	0	0	0.029206	0.022083	0.035402	0.472008659	0.064324	0	0	0.317861	0
A	TOG_RESTL	0.037382	0.076528	0.058617	0.064575	0.001032	0.000553	0.000341	3.62263E-06	0.000631	0.000754	0.968804	0.000189	0.214781
A	TOG_RUNEX	0.012929	0.026293	0.017981	0.022177	0.131178	0.130136	0.032668	0.132840865	0.059404	0.45027	2.908181	0.132826	0.092201
A	TOG_RUNLS	0.217436	0.698567	0.447616	0.443257	0.592941	0.267678	0.189828	0.001328541	0.26747	0.103205	2.436421	0.037169	1.327542
A	TOG_STREX	0.253969	0.388331	0.348567	0.408737	0.083418	0.049477	0.08662	5.9148E-06	0.144248	0.156272	2.201367	0.0298	0.101347

CalEEMod EMFAC2017 Fleet Mix Input — Year 2023

FleetMixLandUseSubType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.539269	0.05885	0.200029	0.117291	0.025913	0.006003	0.010385	0.010246	0.001181	0.000757	0.028495	0.000751	0.000828
Convenience Market (24 H	0.539269	0.05885	0.200029	0.117291	0.025913	0.006003	0.010385	0.010246	0.001181	0.000757	0.028495	0.000751	0.000828
Enclosed Parking with Elev	0.539269	0.05885	0.200029	0.117291	0.025913	0.006003	0.010385	0.010246	0.001181	0.000757	0.028495	0.000751	0.000828
Parking Lot	0.539269	0.05885	0.200029	0.117291	0.025913	0.006003	0.010385	0.010246	0.001181	0.000757	0.028495	0.000751	0.000828

CalEEMod EMFAC2017 Emission Factors Input — Year 2030

Season	EmissionType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
A	CH4_IDLEX	0	0	0	0	0.004104	0.002605	0.005188	0.027066798	0.008824	0	0	0.068888	0
A	CH4_RUNEX	0.001062	0.001635	0.001633	0.001706	0.005798	0.00538	0.001432	0.08619495	0.003748	0.833053	0.334663	0.005462	0.005114
A	CH4_STREX	0.030408	0.03896	0.043872	0.044767	0.009438	0.005206	0.011822	8.65914E-07	0.02166	0.030956	0.253258	0.006135	0.018849
A	CO_IDLEX	0	0	0	0	0.174078	0.133198	0.551828	5.988651525	0.562089	0	0	2.835223	0
A	CO_RUNEX	0.39515	0.497514	0.500356	0.499778	0.53874	0.498358	0.184257	0.596470955	0.398348	6.398355	19.24408	0.47211	0.322398
A	CO_STREX	1.763963	1.944061	2.365016	2.372091	0.898464	0.500582	1.241063	0.019869127	2.281572	2.389953	9.305814	0.875111	1.586482
A	CO2_NBIO_IDLEX	0	0	0	0	8.424391	13.04016	91.23108	902.7737504	72.0507	0	0	329.0611	0
A	CO2_NBIO_RUNEX	216.8353	265.7772	274.9471	331.5967	702.3104	686.5646	1045.93	1280.132048	1322.84	1671.513	217.2106	945.3913	1340.952
A	CO2_NBIO_STREX	45.30983	56.39083	58.54373	68.43076	9.913165	6.642895	11.83489	0.20467843	18.98754	22.73019	60.17452	4.885329	14.87616
A	NOX_IDLEX	0	0	0	0	0.052978	0.075222	0.521106	5.202994293	0.291951	0	0	3.047311	0
A	NOX_RUNEX	0.0213	0.033603	0.032077	0.034081	0.420357	0.388379	1.365983	2.614779728	1.019709	0.460341	1.173097	3.701429	1.140174
A	NOX_STREX	0.130474	0.16619	0.17722	0.181839	0.227903	0.135734	1.544668	2.498654452	0.73348	0.229166	0.274089	1.090758	0.223472
A	PM10_IDLEX	0	0	0	0	0.00095	0.001477	0.000266	0.002568356	9.88E-05	0	0	0.002646	0
A	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.07644	0.08918	0.13034	0.060818132	0.13034	0.105346	0.01176	0.7448	0.13034
A	PM10_PMTW	0.008	0.008	0.008	0.008	0.009946	0.010828	0.012	0.035425367	0.012	0.020357	0.004	0.010639	0.013263
A	PM10_RUNEX	0.00097	0.00111	0.001075	0.001095	0.008388	0.013826	0.006694	0.022671905	0.006449	0.003575	0.002221	0.023998	0.018842
A	PM10_STREX	0.001292	0.001531	0.001375	0.001353	0.000217	0.000106	0.000146	1.53176E-06	0.000206	0.00028	0.002917	7.8E-05	0.000205
A	PM25_IDLEX	0	0	0	0	0.000909	0.001413	0.000255	0.00245725	9.45E-05	0	0	0.002532	0
A	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.03276	0.03822	0.05586	0.026064914	0.05586	0.045148	0.00504	0.3192	0.05586
A	PM25_PMTW	0.002	0.002	0.002	0.002	0.002486	0.002707	0.003	0.008856342	0.003	0.005089	0.001	0.00266	0.003316
A	PM25_RUNEX	0.000893	0.001021	0.000991	0.00101	0.00798	0.013204	0.006394	0.021691043	0.006146	0.003375	0.002072	0.02294	0.017991
A	PM25_STREX	0.001188	0.001408	0.001265	0.001244	0.000199	9.75E-05	0.000134	1.4084E-06	0.000189	0.000258	0.002732	7.17E-05	0.000188
A	ROG_DIURN	0.025117	0.048781	0.046761	0.05207	0.001338	0.000589	0.000371	5.57228E-06	0.001395	0.000646	1.531205	0.000594	0.286242
A	ROG_HTSK	0.067832	0.111389	0.096616	0.101084	0.061609	0.025888	0.021245	0.000276577	0.024738	0.008465	0.662478	0.006713	0.026763
A	ROG_IDLEX	0	0	0	0	0.017399	0.013775	0.025181	0.399973409	0.050372	0	0	0.314347	0
A	ROG_RESTL	0.025037	0.047718	0.051154	0.057244	0.00081	0.000388	0.000247	3.93944E-06	0.000707	0.00039	0.905554	0.000303	0.124927
A	ROG_RUNEX	0.00382	0.00638	0.006135	0.006654	0.079502	0.098148	0.013432	0.026059734	0.021875	0.023072	2.251166	0.070371	0.041311
A	ROG_RUNLS	0.176082	0.428445	0.369476	0.357642	0.533626	0.149225	0.114186	0.001462886	0.299311	0.043279	1.634824	0.043249	0.516682
A	ROG_STREX	0.12933	0.177541	0.194919	0.204532	0.046302	0.024672	0.058993	4.51784E-06	0.110389	0.129873	1.936167	0.034784	0.071811
A	SO2_IDLEX	0	0	0	0	8.15E-05	0.000125	0.000866	0.008283551	0.000687	0	0	0.003138	0
A	SO2_RUNEX	0.000115	0.002763	0.010024	0.003061	0.006845	0.006624	0.010024	0.01137157	0.012858	0.013716	0.002149	0.009051	0.013141
A	SO2_STREX	0	0	0.000117	0.000633	9.81E-05	6.57E-05	0.000117	2.02546E-06	0.000188	0.000225	0.000595	4.83E-05	0.000147
A	TOG_DIURN	0.025117	0.048781	0.046761	0.05207	0.001338	0.000589	0.000371	5.57228E-06	0.001395	0.000646	1.531205	0.000594	0.286242
A	TOG_HTSK	0.067832	0.111389	0.096616	0.101084	0.061609	0.025888	0.021245	0.000276577	0.024738	0.008465	0.662478	0.006713	0.026763
A	TOG_IDLEX	0	0	0	0	0.02417	0.018242	0.03443	0.463873706	0.066713	0	0	0.452317	0
A	TOG_RESTL	0.025037	0.047718	0.051154	0.057244	0.00081	0.000388	0.000247	3.93944E-06	0.000707	0.00039	0.905554	0.000303	0.124927
A	TOG_RUNEX	0.005543	0.009308	0.008904	0.009613	0.094224	0.112968	0.016678	0.115228626	0.029871	0.86306	2.813111	0.084522	0.051069
A	TOG_RUNLS	0.176082	0.428445	0.369476	0.357642	0.533626	0.149225	0.114186	0.001462886	0.299311	0.043279	1.634824	0.043249	0.516682
A	TOG_STREX	0.1416	0.194385	0.213412	0.223937	0.050695	0.027013	0.06459	4.94647E-06	0.120862	0.142195	2.108152	0.038084	0.078623

CalEEMod EMFAC2017 Fleet Mix Input — Year 2030

FleetMixLandUseSubType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.548735	0.059639	0.189953	0.116598	0.024933	0.006381	0.010873	0.011469	0.001123	0.000744	0.027916	0.000814	0.000822
Convenience Market (24 H	0.548735	0.059639	0.189953	0.116598	0.024933	0.006381	0.010873	0.011469	0.001123	0.000744	0.027916	0.000814	0.000822
Enclosed Parking with Elev	0.548735	0.059639	0.189953	0.116598	0.024933	0.006381	0.010873	0.011469	0.001123	0.000744	0.027916	0.000814	0.000822
Parking Lot	0.548735	0.059639	0.189953	0.116598	0.024933	0.006381	0.010873	0.011469	0.001123	0.000744	0.027916	0.000814	0.000822

Adjustment Factors for EMFAC2017 Gasoline Light Duty Vehicles						
Year	NOx Exhaust	TOG Evaporative	TOG Exhaust	PM Exhaust	CO Exhaust	CO2 Exhaust
NA	1	1	1	1	1	1
2021	1.0002	1.0001	1.0002	1.0009	1.0005	1.0023
2022	1.0004	1.0003	1.0004	1.0018	1.0014	1.0065
2023	1.0007	1.0006	1.0007	1.0032	1.0027	1.0126
2024	1.0012	1.0010	1.0011	1.0051	1.0044	1.0207
2025	1.0018	1.0016	1.0016	1.0074	1.0065	1.0309
2026	1.0023	1.0022	1.0020	1.0091	1.0083	1.0394
2027	1.0028	1.0028	1.0024	1.0105	1.0102	1.0475
2028	1.0034	1.0035	1.0028	1.0117	1.0120	1.0554
2029	1.0040	1.0042	1.0032	1.0129	1.0138	1.0629
2030	1.0047	1.0051	1.0037	1.0142	1.0156	1.0702
2031	1.0054	1.0061	1.0042	1.0155	1.0173	1.0770
2032	1.0061	1.0072	1.0047	1.0169	1.0189	1.0834
2033	1.0068	1.0083	1.0052	1.0182	1.0204	1.0893
2034	1.0075	1.0095	1.0058	1.0196	1.0218	1.0947
2035	1.0081	1.0108	1.0063	1.0210	1.0232	1.0997
2036	1.0088	1.0121	1.0069	1.0223	1.0244	1.1041
2037	1.0094	1.0134	1.0074	1.0236	1.0255	1.1080
2038	1.0099	1.0148	1.0079	1.0248	1.0265	1.1114
2039	1.0104	1.0161	1.0085	1.0259	1.0274	1.1143
2040	1.0109	1.0174	1.0090	1.0270	1.0281	1.1168
2041	1.0113	1.0186	1.0095	1.0279	1.0288	1.1189
2042	1.0116	1.0198	1.0099	1.0286	1.0294	1.1207
2043	1.0119	1.0207	1.0103	1.0293	1.0299	1.1221
2044	1.0122	1.0216	1.0106	1.0299	1.0303	1.1233
2045	1.0124	1.0225	1.0109	1.0303	1.0306	1.1243
2046	1.0125	1.0233	1.0111	1.0308	1.0309	1.1251
2047	1.0127	1.0240	1.0113	1.0311	1.0311	1.1258
2048	1.0128	1.0246	1.0115	1.0314	1.0313	1.1263
2049	1.0128	1.0252	1.0116	1.0316	1.0315	1.1268
2050	1.0129	1.0257	1.0117	1.0318	1.0316	1.1272
Enter Year: 2021	**1.0002**	**1.0001**	**1.0002**	**1.0009**	**1.0005**	**1.0023**

*PM Exhaust off model factor is only applied to the PM Exhaust emissions not start/idle

The off-model adjustment factors need to be applied only to emissions from gasoline light duty vehicles (LDA, LDT1, LDT2 and MDV). Please note that the adjustment factors are by calendar year and includes all model years.

Enter NA in the date field if adjustments do not apply

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: Marin
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNE	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_PMB	PM2.5_PMT	PM10_RUN	PM10_IDLE	PM10_STR	PM10_PMB	PM10_PMT	CO2_RUNE	CO2_IDLEX	CO2_STREX	CH4_RUNE	CH4_IDLEX	CH4_STREX	N2O_RUNE	N2O_IDLEX	N2O_STREX	ROG_RUNI	ROG_IDLEX	ROG_STREX	ROG_HOTS	ROG_RUNI	ROG_REST	ROG_DIUR	TOG_RUNE	TOG_IDLEX	TOG_STREX	TOG_HOTS	TOG_RUNL	TOG_REST	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Marin	2021	HHDT	Aggregate	Aggregate	Gasoline	2.250302	319.2517	45.02404	3.752382	0	0.004047	0.000631	0	0.000255	0.005	0.02646	0.000686	0	0.000278	0.02	0.06174	2209.572	0	47.91435	0.082024	0	0.000178	0.144945	0	0.000197	0.378632	0	0.000932	0.039069	0.194214	0.010814	0.019259	0.553958	0	0.00102	0.039069	0.194214	0.010814	0.019259	32.98095	0	4.685244	0.021866	0	0.000474
Marin	2021	HHDT	Aggregate	Aggregate	Diesel	827.1161	80946.98	7373.478	4.516171	56.35693	1.958617	0.058026	0.083281	0	0.008844	0.026001	0.060649	0.087047	0	0.035375	0.060669	1584.22	9519.522	0	0.00634	0.17639	0	0.249017	1.496336	0	0.136508	3.797623	0	0	0	0	0	0.155404	4.323305	0	0	0	0	0	0.514597	47.63631	0	0.014967	0.089936	0
Marin	2021	HHDT	Aggregate	Aggregate	Natural Ga	58.22989	2374.894	227.0966	1.593076	20.81348	0	0.005426	0.031627	0	0.009	0.02646	0.005671	0.033057	0	0.036	0.06174	3151.578	3990.451	0	3.49955	1.253273	0	0.64247	0.813479	0	0.150561	0.043246	0	0	0	0	0	3.686122	1.307928	0	0	0	0	0	10.77925	21.83564	0	0	0	0
Marin	2021	LDA	Aggregate	Aggregate	Gasoline	127526.9	4339106	597960.3	0.050616	0	0.22305	0.001452	0	0.001915	0.002	0.01575	0.001579	0	0.002082	0.008	0.03675	271.5667	0	57.34579	0.003049	0	0.062403	0.00516	0	0.028127	0.012436	0	0.294719	0.12116	0.249612	0.210035	0.223449	0.689108	0	2.489958	0.002687	0	0.000567
Marin	2021	LDA	Aggregate	Aggregate	Diesel	2269.483	75033.94	10516.17	0.134045	0	0	0.010964	0	0	0.002	0.01575	0.011459	0	0	0.008	0.03675	225.6551	0	0	0.000955	0	0	0.03547	0	0	0.020565	0	0	0	0	0	0	0.023412	0	0	0	0	0	0.271885	0	0	0.002133	0	0
Marin	2021	LDA	Aggregate	Aggregate	Electricity	3512.427	135086.4	17287.51	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0
Marin	2021	LDT1	Aggregate	Aggregate	Gasoline	15246.8	495902.9	69545.49	0.110317	0	0.304679	0.001869	0	0.002516	0.002	0.01575	0.002032	0	0.002736	0.008	0.03675	318.1215	0	67.74112	0.005703	0	0.085448	0.008319	0	0.031594	0.025288	0	0.442187	0.221515	0.816731	0.402869	0.46475	0.136737	0	2.697375	0.003148	0	0.00067
Marin	2021	LDT1	Aggregate	Aggregate	Diesel	11.34504	136.7606	36.377	1.303484	0	0	0.184487	0	0	0.002	0.01575	0.192829	0	0	0.008	0.03675	423.2197	0	0	0.011572	0	0	0.066524	0	0	0.249142	0	0	0	0	0	0	0.283632	0	0	0	0	0	1.589521	0	0	0.004001	0	0
Marin	2021	LDT1	Aggregate	Aggregate	Electricity	82.88913	3262.894	410.2878	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0
Marin	2021	LDT2	Aggregate	Aggregate	Gasoline	50147.05	1701693	233492.3	0.083669	0	0.330468	0.001376	0	0.001756	0.002	0.01575	0.001496	0	0.001909	0.008	0.03675	346.1856	0	74.06054	0.003859	0	0.078961	0.006869	0	0.035457	0.015785	0	0.377179	0.135797	0.473025	0.28261	0.278368	0.823539	0	3.06935	0.003426	0	0.000733
Marin	2021	LDT2	Aggregate	Aggregate	Diesel	535.9388	20185.84	2596.657	0.041866	0	0	0.004678	0	0	0.002	0.01575	0.00489	0	0	0.008	0.03675	310.5502	0	0	0.000672	0	0	0.048814	0	0	0.01447	0	0	0	0	0	0	0.016473	0	0	0	0	0	0.137827	0	0	0.002936	0	0
Marin	2021	LDT2	Aggregate	Aggregate	Electricity	383.7821	12613.57	1928.705	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0
Marin	2021	LHDT1	Aggregate	Aggregate	Gasoline	3484.368	123466.1	51911.89	0.2983	0.039662	0.553531	0.002351	0	0.000438	0.002	0.03276	0.002557	0	0.000476	0.008	0.07644	1020.343	122.2775	19.28099	0.014012	0.123523	0.028351	0.01744	0.00314	0.042414	0.069456	0.453953	0.145067	0.142475	1.064669	0.026947	0.049183	0.10135	0.662407	0.15883	0.142475	1.064669	0.026947	0.049183	1.287398	3.741061	1.906129	0.010097	0.00121	0.000191
Marin	2021	LHDT1	Aggregate	Aggregate	Diesel	2667.3	101383.3	33551.28	2.278729	2.258674	0	0.027114	0.027207	0	0.003	0.03276	0.02834	0.028437	0	0.012	0.07644	561.2533	136.597	0	0.008149	0.005098	0	0.088221	0.021471	0	0.175453	0.10976	0	0	0	0	0	0.199742	0.124954	0	0	0	0	0	0.770242	0.909745	0	0.005306	0.001291	0
Marin	2021	LHDT2	Aggregate	Aggregate	Gasoline	462.392	16625.79	6888.951	0.287212	0.039351	0.552295	0.002073	0	0.000348	0.002	0.03822	0.002254	0	0.000378	0.008	0.08918	1164.467	140.5864	21.87522	0.010751	0.1242	0.026836	0.017618	0.003095	0.042104	0.050074	0.450809	0.135539	0.120933	0.800064	0.022817	0.040933	0.073068	0.657819	0.148398	0.120933	0.800064	0.022817	0.040933	0.922563	3.750409	1.876295	0.011523	0.001391	0.000216
Marin	2021	LHDT2	Aggregate	Aggregate	Diesel	821.1316	32937.26	10328.8	1.469304	2.16929	0	0.022167	0.026882	0	0.003	0.03822	0.023169	0.028097	0	0.012	0.08918	622.6211	216.3835	0	0.00708	0.005098	0	0.097867	0.034012	0	0.15242	0.10976	0	0	0	0	0	0.17352	0.124954	0	0	0	0	0	0.647307	0.909745	0	0.005886	0.002046	0
Marin	2021	MCY	Aggregate	Aggregate	Gasoline	6924.619	51879.95	13849.24	1.19829	0	0.275284	0.001938	0	0.003602	0.001	0.00504	0.002066	0	0.003809	0.004	0.01176	218.7386	0	62.94624	0.350223	0	0.266109	0.06819	0	0.015388	2.41485	0	2.053769	0.804965	2.663702	0.986267	1.593288	2.95685	0	2.233984	0.804965	2.663702	0.986267	1.593288	22.04268	0	9.044114	0.002165	0	0.000623
Marin	2021	MDV	Aggregate	Aggregate	Gasoline	29303.34	957950.5	135376.7	0.110133	0	0.39429	0.001476	0	0.001991	0.002	0.01575	0.001604	0	0.002163	0.008	0.03675	417.8433	0	89.92526	0.005162	0	0.093756	0.008388	0	0.037962	0.023367	0	0.474039	0.150395	0.493473	0.325741	0.314963	0.032965	0	0.51895	0.150395	0.493473	0.325741	0.314963	1.012872	0	3.591374	0.004135	0	0.00089
Marin	2021	MDV	Aggregate	Aggregate	Diesel	1101.575	39738.76	5296.334	0.053243	0	0	0.005011	0	0	0.002	0.01575	0.005238	0	0	0.008	0.03675	406.7832	0	0	0.000583	0	0	0.063941	0	0	0.012541	0	0	0	0	0	0	0.014278	0	0	0	0	0	0.22	0	0	0.003846	0	0
Marin	2021	MDV	Aggregate	Aggregate	Electricity	128.2481	4432.762	654.4533	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0
Marin	2021	MH	Aggregate	Aggregate	Gasoline	510.9552	4881.502	51.11595	0.492243	0	0.331565	0.00171	0	0.000377	0.003	0.05586	0.00186	0	0.00041	0.012	0.13034	1778.522	0	26.49939	0.017474	0	0.033543	0.02888	0	0.033429	0.077506	0	0.145658	0.093563	2.301504	0.036306	0.098296	0.113096	0	0.159477	0.093563	2.301504	0.036306	0.098296	1.989377	0	3.238227	0.0176	0	0.000262
Marin	2021	MH	Aggregate	Aggregate	Diesel	216.0234	2153.846	21.60234	4.299802	0	0	0.097603	0	0	0.004	0.05586	0.102016	0	0	0.016	0.13034	1035.926	0	0	0.005223	0	0	0.162833	0	0	0.112444	0	0	0	0	0	0	0.12801	0	0	0	0	0	0.401818	0	0	0.009793	0	0
Marin	2021	MHDT	Aggregate	Aggregate	Gasoline	338.3585	17459.87	6769.877	0.697416	0.088154	0.390762	0.001303	0	0.000494	0.003	0.05586	0.001417	0	0.000537	0.012	0.13034	1772.499	544.7877	40.73674	0.022744	0.255084	0.042966	0.031925	0.00698	0.028556	0.115255	1.007702	0.238978	0.103014	0.627233	0.022882	0.040716	0.16818	1.470436	0.261651	0.103014	0.627233	0.022882	0.040716	2.648575	15.05853	5.464262	0.01754	0.005391	0.000403
Marin	2021	MHDT	Aggregate	Aggregate	Diesel	1349.81	69763.21	12344.41	3.239356	12.27851	1.430917	0.080283	0.028033	0	0.003	0.05586	0.083913	0.029301	0	0.012	0.13034	1085.455	1271.075	0	0.009236	0.006721	0	0.170618	0.199795	0	0.19885	0.144701	0	0	0	0	0	0.226376	0.164731	0	0	0	0	0	0.565058	3.295184	0	0.010255	0.012008	0
Marin	2021	OBUS	Aggregate	Aggregate	Gasoline	129.5605	6908.736	2592.246	0.509847	0.065181	0.326785	0.000912	0	0.000202	0.003	0.05586	0.000992	0	0.000219	0.012	0.13034	1801.195	382.1152	26.88642	0.015009	0.202279	0.031305	0.025665	0.005671	0.026524	0.070618	0.748105	0.16076	0.025801	0.291739	0.013615	0.027917	0.103046	1.091633	0.176012	0.025801	0.291739	0.013615	0.027917	1.59095	5.785572	3.416244	0.017824	0.003781	0.000266
Marin	2021	OBUS	Aggregate	Aggregate	Diesel	42.82966	3457.818	433.461	3.56353	26.46462	1.613087	0.084474	0.100552	0	0.003	0.05586	0.088293	0.105099	0	0.012	0.13034	1294.141	3522.962	0	0.009729	0.074559	0	0.203421	0.553761	0	0.209464	1.605237	0	0	0	0	0	0.238459	1.82744	0	0	0	0	0	0.645348	17.07367	0	0.012226	0.033283	0
Marin	2021	SBUS	Aggregate	Aggregate	Gasoline	32.22904	1626.813	128.9162	0.974559	0.915669	0.545987	0.002008	0	0.000714	0.002	0.3192	0.002184	0	0.000777	0.008	0.7448	862.9375	2562.599	53.05899	0.028836	2.391294	0.06919	0.044057	0.083203	0.048165	0.144927	10.48279	0.408793	0.122142	0.843289	0.014515	0.040484	0.211477	15.29647	0.447577	0.122142	0.843289	0.014515	0.040484	3.465248	81.27707	11.39165	0.008539	0.025359	0.000525
Marin	2021	SBUS	Aggregate	Aggregate	Diesel	146.7382	4586.495	1693.338	8.962842	54.28167	0.481926	0.04993	0.063982	0	0.003	0.3192	0.052187	0.066875	0	0.012	0.7448	1164.574	3766.046	0	0.005647	0.012536	0	0.183055	0.59197	0	0.121575	0.26989	0	0	0	0	0	0.138404	0.30725	0	0	0	0	0	0.313498	4.547552	0	0.011002	0.03558	0
Marin	2021	UBUS	Aggregate	Aggregate	Gasoline	35.7647	3313.681	143.0588	0.322622	0	0.788542	0.001184	0	0.000436	0.002959	0.055135	0.001288	0	0.000474	0.011836	0.128648	2264.405	0	81.36802	0.006724	0	0.10301	0.02678	0	0.067305	0.02213	0	0.435753	0.043845	0.268175	0.007642	0.011795	0.032292	0	0.477095	0.043845	0.268175	0.007642	0.011795	0.386681	0	7.029733	0.022408	0	0.000805
Marin	2021	UBUS	Aggregate	Aggregate	Diesel	51.44601	3061.189	205.7841	2.909816	0	0	0.007019	0	0	0.007376	0.034416	0.007337	0	0	0.029506	0.080303	1581.502	0	0	0.191383	0	0	0.24859	0	0	0.002734	0	0	0	0	0	0	0.195321	0	0	0	0	0	0.313477	0	0	0.014951	0	0
Marin	2021	UBUS	Aggregate	Aggregate	Natural Ga	4.38243	97.1859	17.52972	0.391559	0	0	0.002599	0	0	0.005682	0.042716	0.002716	0	0	0.02273	0.099671	1674.504	0	0	4.767631	0	0	0.341359	0	0	0.06812	0	0	0	0	0	0	4.865717	0	0	0	0	0	35.70559	0	0	0	0	0

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: Marin
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNE	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_PM	CO2_RUNE	CO2_IDLEX	CO2_STREX	CH4_RUNE	CH4_IDLEX	CH4_STREX	N2O_RUNE	N2O_IDLEX	N2O_STREX	ROG_RUNI	ROG_IDLEX	ROG_STRE	ROG_HOTS	ROG_RUNI	ROG_REST	ROG_DIUR	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_HOTS	TOG_RUNI	TOG_REST	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Marin	2022	HHDT	Aggregate	Aggregate	Gasoline	2.322679	314.838	46.47216	3.718242	0	0.004003	0.000647	0	0.000249	0.005	0.02646	0.000704	0	0.000271	0.02	0.06174	2183.57	0	46.80932	0.081583	0	0.000175	0.145168	0	0.000195	0.37511	0	0.000916	0.040965	0.207154	0.011396	0.019226	0.54736	0	0.001003	0.040965	0.207154	0.011396	0.019226	32.58226	0	4.160093	0.021608	0	0.000463
Marin	2022	HHDT	Aggregate	Aggregate	Diesel	847.3732	82872.96	7541.85	3.867562	55.40396	2.17317	0.03323	0.041401	0	0.008847	0.026009	0.034732	0.043273	0	0.035387	0.060689	1537.488	9632.918	0	0.003845	0.174373	0	0.241672	1.514161	0	0.082778	3.754212	0	0	0	0	0	0.094236	4.273885	0	0	0	0	0	0.361629	50.23551	0	0.014525	0.091007	0
Marin	2022	HHDT	Aggregate	Aggregate	Natural Ga	60.1787	2454.834	234.6969	1.445264	20.47389	0	0.005097	0.028628	0	0.009	0.02646	0.005327	0.029923	0	0.036	0.06174	3130.749	3960.823	0	3.446276	1.242032	0	0.638224	0.80744	0	0.138227	0.040154	0	0	0	0	0	3.618567	1.293116	0	0	0	0	0	10.82954	21.85143	0	0	0	0
Marin	2022	LDA	Aggregate	Aggregate	Gasoline	129563.8	4355174	608209.8	0.044156	0	0.208071	0.001383	0	0.00183	0.002	0.01575	0.001504	0	0.00199	0.008	0.03675	264.1501	0	55.77464	0.002651	0	0.057532	0.004718	0	0.027024	0.010618	0	0.267457	0.113012	0.238311	0.196588	0.206753	0.015485	0	0.29283	0.113012	0.238311	0.196588	0.206753	0.630963	0	2.418165	0.002614	0	0.000552
Marin	2022	LDA	Aggregate	Aggregate	Diesel	2272.772	73283.39	10501.26	0.116195	0	0	0.00988	0	0	0.002	0.01575	0.010326	0	0	0.008	0.03675	221.232	0	0	0.000876	0	0	0.034775	0	0	0.018852	0	0	0	0	0	0	0.021461	0	0	0	0	0	0.260094	0	0	0.002091	0	0
Marin	2022	LDA	Aggregate	Aggregate	Electricity	3850.387	149672.8	18881.41	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0
Marin	2022	LDT1	Aggregate	Aggregate	Gasoline	15428.61	496265.8	70497.86	0.094578	0	0.28182	0.001736	0	0.002347	0.002	0.01575	0.001888	0	0.002552	0.008	0.03675	310.2879	0	66.01985	0.004892	0	0.077988	0.00741	0	0.030304	0.021449	0	0.397738	0.205105	0.757214	0.3774	0.428284	0.031281	0	0.43547	0.205105	0.757214	0.3774	0.428284	1.00663	0	2.598278	0.003071	0	0.000653
Marin	2022	LDT1	Aggregate	Aggregate	Diesel	10.37569	124.1997	33.04358	1.213652	0	0	0.172221	0	0	0.002	0.01575	0.180008	0	0	0.008	0.03675	417.5434	0	0	0.010819	0	0	0.065632	0	0	0.232932	0	0	0	0	0	0	0.265178	0	0	0	0	0	1.484678	0	0	0.003947	0	0
Marin	2022	LDT1	Aggregate	Aggregate	Electricity	109.0022	4442.41	541.764	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0
Marin	2022	LDT2	Aggregate	Aggregate	Gasoline	50593.24	1685774	235337.4	0.073326	0	0.305114	0.00133	0	0.001702	0.002	0.01575	0.001446	0	0.001852	0.008	0.03675	335.6699	0	71.9273	0.003468	0	0.074109	0.006245	0	0.03378	0.01401	0	0.350403	0.131688	0.465107	0.280768	0.272615	0.020438	0	0.383646	0.131688	0.465107	0.280768	0.272615	0.764729	0	2.983184	0.003322	0	0.000712
Marin	2022	LDT2	Aggregate	Aggregate	Diesel	556.476	20219.11	2678.125	0.039922	0	0	0.004639	0	0	0.002	0.01575	0.004848	0	0	0.008	0.03675	305.0175	0	0	0.000669	0	0	0.047945	0	0	0.014412	0	0	0	0	0	0	0.016408	0	0	0	0	0	0.140502	0	0	0.002884	0	0
Marin	2022	LDT2	Aggregate	Aggregate	Electricity	481.0798	15470.03	2412.355	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0
Marin	2022	LHDT1	Aggregate	Aggregate	Gasoline	3455.817	121161.5	51486.53	0.271723	0.038749	0.536509	0.002314	0	0.000426	0.002	0.03276	0.002516	0	0.000464	0.008	0.07644	1010.412	121.4506	19.13297	0.012929	0.121453	0.026699	0.015961	0.003114	0.041482	0.064121	0.443579	0.136297	0.138453	1.030335	0.026619	0.047963	0.093565	0.64727	0.149229	0.138453	1.030335	0.026619	0.047963	1.191132	3.743966	1.856644	0.009999	0.001202	0.000189
Marin	2022	LHDT1	Aggregate	Aggregate	Diesel	2719.92	102034.5	34213.17	2.026741	2.160834	0	0.025142	0.02701	0	0.003	0.03276	0.026279	0.028231	0	0.012	0.07644	553.7404	135.1688	0	0.007884	0.005098	0	0.08704	0.021247	0	0.169727	0.10976	0	0	0	0	0	0.193223	0.124954	0	0	0	0	0	0.74564	0.909745	0	0.005235	0.001278	0
Marin	2022	LHDT2	Aggregate	Aggregate	Gasoline	465.6701	16573.73	6937.79	0.255682	0.038311	0.535794	0.002036	0	0.000336	0.002	0.03822	0.002215	0	0.000365	0.008	0.08918	1152.319	139.5271	21.68075	0.009421	0.12179	0.025241	0.015902	0.003065	0.041238	0.043396	0.439018	0.126888	0.11632	0.751873	0.022241	0.039108	0.063324	0.640614	0.138927	0.11632	0.751873	0.022241	0.039108	0.80206	3.754459	1.812577	0.011403	0.001381	0.000215
Marin	2022	LHDT2	Aggregate	Aggregate	Diesel	862.0879	33937.49	10843.98	1.294438	2.057558	0	0.021217	0.026825	0	0.003	0.03822	0.022176	0.028038	0	0.012	0.08918	613.9646	213.9782	0	0.006912	0.005098	0	0.096507	0.033634	0	0.148812	0.10976	0	0	0	0	0	0.169412	0.124954	0	0	0	0	0	0.634359	0.909745	0	0.005804	0.002023	0
Marin	2022	MCY	Aggregate	Aggregate	Gasoline	7015.065	51666.26	14030.13	1.193857	0	0.2756	0.00196	0	0.00347	0.001	0.00504	0.002092	0	0.003673	0.004	0.01176	218.4694	0	62.60806	0.347416	0	0.264387	0.067993	0	0.015407	2.384728	0	2.038653	0.789408	2.561423	0.979119	1.588688	2.930841	0	2.217831	0.789408	2.561423	0.979119	1.588688	21.5316	0	9.070736	0.002162	0	0.00062
Marin	2022	MDV	Aggregate	Aggregate	Gasoline	29660.65	955422.8	137072.8	0.092148	0	0.358863	0.001401	0	0.001881	0.002	0.01575	0.001524	0	0.002045	0.008	0.03675	404.8492	0	87.11354	0.004308	0	0.086373	0.007429	0	0.035906	0.018043	0	0.429964	0.144194	0.478125	0.318693	0.303631	0.026283	0	0.47075	0.144194	0.478125	0.318693	0.303631	0.864981	0	3.406087	0.004006	0	0.000862
Marin	2022	MDV	Aggregate	Aggregate	Diesel	1137.649	39734.21	5438.47	0.048401	0	0	0.004773	0	0	0.002	0.01575	0.004989	0	0	0.008	0.03675	398.3749	0	0	0.00056	0	0	0.062619	0	0	0.012064	0	0	0	0	0	0	0.013734	0	0	0	0	0	0.218353	0	0	0.003766	0	0
Marin	2022	MDV	Aggregate	Aggregate	Electricity	200.4776	6795.888	1022.094	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0
Marin	2022	MH	Aggregate	Aggregate	Gasoline	504.9258	4888.784	50.51278	0.424131	0	0.333712	0.001612	0	0.000356	0.003	0.05586	0.001753	0	0.000387	0.012	0.13034	1750.985	0	26.04277	0.014745	0	0.032859	0.025997	0	0.034458	0.063653	0	0.140007	0.085554	2.110139	0.033533	0.089436	0.092882	0	0.15329	0.085554	2.110139	0.033533	0.089436	1.5825	0	3.098997	0.017327	0	0.000258
Marin	2022	MH	Aggregate	Aggregate	Diesel	221.6198	2169.947	22.16198	4.137214	0	0	0.09107	0	0	0.004	0.05586	0.095188	0	0	0.016	0.13034	1024.433	0	0	0.005079	0	0	0.161027	0	0	0.109353	0	0	0	0	0	0	0.124491	0	0	0	0	0	0.387033	0	0	0.009685	0	0
Marin	2022	MHDT	Aggregate	Aggregate	Gasoline	338.6158	17672.47	6775.025	0.568993	0.088411	0.383156	0.001263	0	0.000457	0.003	0.05586	0.001374	0	0.000497	0.012	0.13034	1743.831	538.8171	39.82282	0.018166	0.259948	0.041529	0.027028	0.007264	0.028994	0.090914	1.011571	0.227679	0.094464	0.570819	0.020632	0.03597	0.132662	1.476083	0.24928	0.094464	0.570819	0.020632	0.03597	2.081247	15.10332	5.142999	0.017257	0.005332	0.000394
Marin	2022	MHDT	Aggregate	Aggregate	Diesel	1347.742	70318.68	12193.99	2.374549	11.00489	1.704483	0.041846	0.018096	0	0.003	0.05586	0.043738	0.018914	0	0.012	0.13034	1056.091	1265.645	0	0.004516	0.005759	0	0.166003	0.198942	0	0.097223	0.123987	0	0	0	0	0	0.110681	0.14115	0	0	0	0	0	0.330729	3.359638	0	0.009977	0.011957	0
Marin	2022	OBUS	Aggregate	Aggregate	Gasoline	127.856	6584.562	2558.144	0.466447	0.065188	0.324034	0.000941	0	0.000206	0.003	0.05586	0.001024	0	0.000224	0.012	0.13034	1781.863	379.5718	26.61701	0.013689	0.202274	0.030744	0.023853	0.005697	0.026431	0.06427	0.748207	0.157666	0.026708	0.303349	0.014258	0.029041	0.093782	1.091782	0.172625	0.026708	0.303349	0.014258	0.029041	1.441171	5.786194	3.343722	0.017633	0.003756	0.000263
Marin	2022	OBUS	Aggregate	Aggregate	Diesel	43.84264	3639.916	440.6047	2.446288	18.60711	1.9937	0.03143	0.031053	0	0.003	0.05586	0.032851	0.032458	0	0.012	0.13034	1249.636	3318.7	0	0.003467	0.057066	0	0.196425	0.521653	0	0.074638	1.228605	0	0	0	0	0	0.084969	1.398674	0	0	0	0	0	0.291246	16.27224	0	0.011806	0.031353	0
Marin	2022	SBUS	Aggregate	Aggregate	Gasoline	34.30664	1705.151	137.2265	0.867962	0.91824	0.555039	0.001868	0	0.000697	0.002	0.3192	0.002031	0	0.000759	0.008	0.7448	852.9793	2537.521	51.573	0.025155	2.407311	0.066136	0.039777	0.08499	0.049522	0.126564	10.52036	0.388455	0.107491	0.736091	0.013161	0.035317	0.184683	15.35129	0.425309	0.107491	0.736091	0.013161	0.035317	3.022088	81.50519	10.72465	0.008441	0.025111	0.00051
Marin	2022	SBUS	Aggregate	Aggregate	Diesel	148.3604	4641.985	1712.059	8.674391	53.04736	0.541068	0.048722	0.060646	0	0.003	0.3192	0.050925	0.063388	0	0.012	0.7448	1153.864	3744.252	0	0.005564	0.012385	0	0.181371	0.588544	0	0.119794	0.266644	0	0	0	0	0	0.136376	0.303554	0	0	0	0	0	0.311894	4.776441	0	0.010901	0.035374	0
Marin	2022	UBUS	Aggregate	Aggregate	Gasoline	35.78096	3315.187	143.1238	0.32774	0	0.797042	0.001267	0	0.000463	0.002959	0.055135	0.001378	0	0.000503	0.011836	0.128648	2244.953	0	80.82837	0.00672	0	0.104086	0.027038	0	0.067692	0.022127	0	0.440698	0.053175	0.330527	0.009193	0.013913	0.032287	0	0.482509	0.053175	0.330527	0.009193	0.013913	0.390684	0	7.027006	0.022216	0	0.0008
Marin	2022	UBUS	Aggregate	Aggregate	Diesel	58.27691	2764.351	233.1076	0.864875	0	0	0.005377	0	0	0.007201	0.035273	0.00562	0	0	0.028806	0.082303	1365.814	0	0	0.074581	0	0	0.214687	0	0	0.001066	0	0	0	0	0	0	0.076116	0	0	0	0	0	0.123767	0	0	0.012912	0	0
Marin	2022	UBUS	Aggregate	Aggregate	Natural Ga	11.18311	395.4604	44.73242	0.479123	0	0	0.003122	0	0	0.008183	0.030464	0.003263	0	0	0.032732	0.071082	1980.585	0	0	6.241614	0	0	0.403755	0	0	0.08918	0	0	0	0	0	0	6.370025	0	0	0	0	0	48.33079	0	0	0	0	0

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: Marin
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNE	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_PMB	PM2.5_PMT	PM10_RUN	PM10_IDLE	PM10_STR	PM10_PMB	PM10_PMT	CO2_RUNE	CO2_IDLEX	CO2_STREX	CH4_RUNE	CH4_IDLEX	CH4_STREX	N2O_RUNEX	N2O_IDLEX	N2O_STREX	ROG_RUNI	ROG_IDLEX	ROG_STREX	ROG_HOTS	ROG_RUNI	ROG_REST	ROG_DIUR	TOG_RUNE	TOG_IDLEX	TOG_STREX	TOG_HOTS	TOG_RUNI	TOG_REST	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Marin	2023	HHDT	Aggregate	Aggregate	Gasoline	2.370916	306.003	47.43728	3.456262	0	0.003398	0.000671	0	0.000248	0.005	0.02646	0.00073	0	0.00027	0.02	0.06174	2155.471	0	46.86619	0.078437	0	0.000173	0.139705	0	0.000194	0.357242	0	0.000906	0.043515	0.222811	0.012156	0.019683	0.521286	0	0.000992	0.043515	0.222811	0.012156	0.019683	32.14645	0	4.382798	0.02133	0	0.000464
Marin	2023	HHDT	Aggregate	Aggregate	Diesel	864.5484	84838.08	7667.602	3.033171	50.73442	2.463706	0.023905	0.034885	0	0.008849	0.026017	0.024986	0.036463	0	0.035398	0.060707	1461.041	9244.968	0	0.001213	0.173485	0	0.229655	1.45318	0	0.02611	3.73508	0	0	0	0	0.029724	4.252105	0	0	0	0	0	0	0.236884	53.41158	0	0.013803	0.087342	0
Marin	2023	HHDT	Aggregate	Aggregate	Natural Ga	61.72523	2517.857	240.7284	1.317036	20.17729	0	0.004815	0.026087	0	0.009	0.02646	0.005033	0.027266	0	0.036	0.06174	3110.087	3931.266	0	3.400209	1.232516	0	0.634012	0.801414	0	0.127515	0.037497	0	0	0	0	3.560098	1.280532	0	0	0	0	0	0	10.87339	21.86893	0	0	0	0
Marin	2023	LDA	Aggregate	Aggregate	Gasoline	131553.3	4374907	618062.6	0.038909	0	0.194769	0.001322	0	0.001753	0.002	0.01575	0.001437	0	0.001907	0.008	0.03675	256.7407	0	54.21129	0.002321	0	0.053166	0.004354	0	0.025966	0.00912	0	0.243495	0.105807	0.228268	0.184273	0.191849	0.013303	0	0.266595	0.105807	0.228268	0.184273	0.191849	0.583348	0	2.34627	0.002541	0	0.000536
Marin	2023	LDA	Aggregate	Aggregate	Diesel	2268.885	71569.93	10453.37	0.100838	0	0	0.008938	0	0	0.002	0.01575	0.009342	0	0	0.008	0.03675	216.4917	0	0	0.000806	0	0	0.034029	0	0	0.017342	0	0	0	0	0	0.019743	0	0	0	0	0	0	0.249228	0	0	0.002047	0	0
Marin	2023	LDA	Aggregate	Aggregate	Electricity	4237.673	167357	20726.78	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0
Marin	2023	LDT1	Aggregate	Aggregate	Gasoline	15619.75	497563.5	71471.62	0.081316	0	0.261194	0.001621	0	0.002197	0.002	0.01575	0.001763	0	0.002389	0.008	0.03675	302.3719	0	64.30006	0.004202	0	0.071251	0.006639	0	0.029069	0.018187	0	0.358014	0.189996	0.705199	0.353468	0.395019	0.026532	0	0.391979	0.189996	0.705199	0.353468	0.395019	0.896483	0	2.503475	0.002992	0	0.000636
Marin	2023	LDT1	Aggregate	Aggregate	Diesel	9.501206	114.0156	30.10747	1.118576	0	0	0.1592	0	0	0.002	0.01575	0.166398	0	0	0.008	0.03675	410.7999	0	0	0.010015	0	0	0.064572	0	0	0.215622	0	0	0	0	0	0.245471	0	0	0	0	0	0	1.373847	0	0	0.003884	0	0
Marin	2023	LDT1	Aggregate	Aggregate	Electricity	138.9456	5825.749	691.7468	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0
Marin	2023	LDT2	Aggregate	Aggregate	Gasoline	50999.73	1672558	236983	0.064615	0	0.282611	0.001291	0	0.001659	0.002	0.01575	0.001404	0	0.001804	0.008	0.03675	325.1651	0	69.80876	0.003125	0	0.069568	0.005711	0	0.032193	0.012466	0	0.3258	0.127773	0.458119	0.278733	0.267241	0.018188	0	0.35671	0.127773	0.458119	0.278733	0.267241	0.711315	0	2.901456	0.003218	0	0.000691
Marin	2023	LDT2	Aggregate	Aggregate	Diesel	573.8956	20192.3	2744.173	0.038289	0	0	0.00461	0	0	0.002	0.01575	0.004818	0	0	0.008	0.03675	299.0993	0	0	0.000668	0	0	0.047014	0	0	0.014374	0	0	0	0	0	0.016364	0	0	0	0	0	0	0.142908	0	0	0.002828	0	0
Marin	2023	LDT2	Aggregate	Aggregate	Electricity	592.1076	18637.24	2961.846	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0
Marin	2023	LHDT1	Aggregate	Aggregate	Gasoline	3424.787	119094.4	5104.23	0.244369	0.03778	0.519728	0.002271	0	0.000412	0.002	0.03276	0.00247	0	0.000448	0.008	0.07644	999.0343	120.4868	18.97551	0.011535	0.119288	0.025174	0.014495	0.003085	0.040588	0.056765	0.432589	0.128229	0.133645	0.997941	0.025878	0.046097	0.082832	0.631233	0.140395	0.133645	0.997941	0.025878	0.046097	1.06354	3.747449	1.81269	0.009886	0.001192	0.000188
Marin	2023	LHDT1	Aggregate	Aggregate	Diesel	2770.651	102611.7	34851.31	1.800178	2.064031	0	0.023324	0.026851	0	0.003	0.03276	0.024379	0.028065	0	0.012	0.07644	545.7943	133.6287	0	0.007641	0.005098	0	0.085791	0.021005	0	0.164516	0.10976	0	0	0	0	0.18729	0.124954	0	0	0	0	0	0	0.723937	0.909745	0	0.00516	0.001263	0
Marin	2023	LHDT2	Aggregate	Aggregate	Gasoline	468.7318	16520.56	6983.406	0.227324	0.037247	0.518202	0.002007	0	0.000325	0.002	0.03822	0.002183	0	0.000354	0.008	0.08918	1138.777	138.3242	21.46766	0.008251	0.119265	0.023711	0.014353	0.003031	0.040302	0.037529	0.426931	0.118586	0.111319	0.702443	0.021612	0.037259	0.054762	0.622977	0.129837	0.111319	0.702443	0.021612	0.037259	0.696512	3.758167	1.75372	0.011269	0.001369	0.000212
Marin	2023	LHDT2	Aggregate	Aggregate	Diesel	901.7193	34842.8	11342.49	1.142924	1.951762	0	0.020433	0.026778	0	0.003	0.03822	0.021357	0.027989	0	0.012	0.08918	605.0059	211.4435	0	0.006768	0.005098	0	0.095099	0.033236	0	0.145704	0.10976	0	0	0	0	0.165874	0.124954	0	0	0	0	0	0	0.62429	0.909745	0	0.005719	0.001999	0
Marin	2023	MCY	Aggregate	Aggregate	Gasoline	7093.436	51472.53	14186.87	1.189892	0	0.275576	0.001971	0	0.003258	0.001	0.00504	0.002105	0	0.003454	0.004	0.01176	218.2252	0	62.23681	0.344974	0	0.26269	0.067817	0	0.015415	2.358588	0	2.023258	0.770323	2.436421	0.968804	1.580476	2.908181	0	2.201367	0.770323	2.436421	0.968804	1.580476	21.09046	0	9.102345	0.00216	0	0.000616
Marin	2023	MDV	Aggregate	Aggregate	Gasoline	30011.06	954428.5	138706.8	0.079329	0	0.32782	0.00134	0	0.001794	0.002	0.01575	0.001458	0	0.001951	0.008	0.03675	391.9667	0	84.4216	0.003784	0	0.0797	0.006657	0	0.033944	0.015609	0	0.391891	0.138549	0.465352	0.3133	0.295012	0.022751	0	0.429068	0.138549	0.465352	0.3133	0.295012	0.786791	0	3.247018	0.003879	0	0.000835
Marin	2023	MDV	Aggregate	Aggregate	Diesel	1169.944	39704.38	5562.217	0.044081	0	0	0.004541	0	0	0.002	0.01575	0.004746	0	0	0.008	0.03675	389.5439	0	0	0.000539	0	0	0.061231	0	0	0.011598	0	0	0	0	0	0.013203	0	0	0	0	0	0	0.216306	0	0	0.003683	0	0
Marin	2023	MDV	Aggregate	Aggregate	Electricity	283.0616	9377.471	1439.318	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0
Marin	2023	MH	Aggregate	Aggregate	Gasoline	501.0557	4898.187	50.12561	0.372426	0	0.334382	0.001543	0	0.000342	0.003	0.05586	0.001678	0	0.000372	0.012	0.13034	1726.734	0	25.61832	0.012841	0	0.032123	0.023777	0	0.035216	0.054291	0	0.134499	0.078979	1.928948	0.031221	0.081913	0.079221	0	0.147259	0.078979	1.928948	0.031221	0.081913	1.315313	0	2.97659	0.017087	0	0.000254
Marin	2023	MH	Aggregate	Aggregate	Diesel	227.0799	2186.161	22.70799	3.989886	0	0	0.085154	0	0	0.004	0.05586	0.089004	0	0	0.016	0.13034	1013.916	0	0	0.004948	0	0	0.159373	0	0	0.106534	0	0	0	0	0	0.121282	0	0	0	0	0	0	0.373482	0	0	0.009585	0	0
Marin	2023	MHDT	Aggregate	Aggregate	Gasoline	340.9177	17931.13	6821.081	0.466074	0.088627	0.375533	0.001239	0	0.000429	0.003	0.05586	0.001348	0	0.000467	0.012	0.13034	1718.209	533.0051	38.96432	0.014577	0.264084	0.040141	0.023094	0.007511	0.029321	0.071875	1.014805	0.217019	0.087093	0.520722	0.018706	0.031905	0.10488	1.480801	0.237608	0.087093	0.520722	0.018706	0.031905	1.640264	15.14077	4.848739	0.017003	0.005275	0.000286
Marin	2023	MHDT	Aggregate	Aggregate	Diesel	1330.762	70922.65	11890	1.705089	9.39061	2.128121	0.007887	0.008284	0	0.003	0.05586	0.008244	0.008659	0	0.012	0.13034	1019.622	1253.781	0	0.000588	0.004831	0	0.16027	0.197077	0	0.012659	0.104015	0	0	0	0	0.014411	0.118413	0	0	0	0	0	0	0.115744	3.517008	0	0.009633	0.011845	0
Marin	2023	OBUS	Aggregate	Aggregate	Gasoline	126.035	6288.279	2521.708	0.431224	0.065195	0.322117	0.000971	0	0.000211	0.003	0.05586	0.001056	0	0.000229	0.012	0.13034	1762.799	377.0365	26.38299	0.01259	0.2022	0.030272	0.022317	0.005717	0.026364	0.059056	0.748317	0.155233	0.02755	0.315146	0.01488	0.030105	0.086174	1.091942	0.169961	0.02755	0.315146	0.01488	0.030105	1.301844	5.78686	3.291843	0.017444	0.003731	0.000261
Marin	2023	OBUS	Aggregate	Aggregate	Diesel	45.13689	3814.103	449.4934	1.849239	14.00397	2.215211	0.012201	0.004599	0	0.003	0.05586	0.012753	0.004807	0	0.012	0.13034	1219.379	3078.901	0	0.000623	0.048357	0	0.191669	0.48396	0	0.013413	1.041104	0	0	0	0	0.015269	1.185218	0	0	0	0	0	0	0.144784	16.40134	0	0.01152	0.029088	0
Marin	2023	SBUS	Aggregate	Aggregate	Gasoline	35.55027	1741.837	142.2011	0.63715	0.922766	0.545264	0.001614	0	0.000664	0.002	0.3192	0.001755	0	0.000722	0.008	0.7448	841.336	2510.632	49.23413	0.017884	2.437783	0.061814	0.031495	0.087893	0.050864	0.088977	10.58651	0.357768	0.073684	0.488575	0.009922	0.024194	0.129835	15.4478	0.391711	0.073684	0.488575	0.009922	0.024194	2.073511	81.90683	9.561102	0.008326	0.024845	0.000487
Marin	2023	SBUS	Aggregate	Aggregate	Diesel	149.6531	4687.64	1726.976	8.369237	51.77231	0.601765	0.04743	0.057376	0	0.003	0.3192	0.049575	0.05997	0	0.012	0.7448	1142.942	3720.666	0	0.005465	0.012259	0	0.179655	0.584837	0	0.117652	0.263932	0	0	0	0	0.133938	0.300467	0	0	0	0	0	0	0.30955	5.013283	0	0.010798	0.035151	0
Marin	2023	UBUS	Aggregate	Aggregate	Gasoline	35.79722	3316.694	143.1889	0.305064	0	0.766739	0.001556	0	0.000556	0.002959	0.055135	0.001692	0	0.000605	0.011836	0.128648	2168.787	0	78.56328	0.006738	0	0.099352	0.02551	0	0.066511	0.022125	0	0.419806	0.050216	0.303553	0.008866	0.013427	0.032285	0	0.459635	0.050216	0.303553	0.008866	0.013427	0.373046	0	7.02563	0.021462	0	0.000777
Marin	2023	UBUS	Aggregate	Aggregate	Diesel	56.94108	2735.932	227.7643	0.736038	0	0	0.005241	0	0	0.007247	0.035051	0.005478	0	0	0.028987	0.081786	1355.588	0	0	0.068936	0	0	0.21308	0	0	0.000985	0	0	0	0	0	0.070354	0	0	0	0	0	0	0.115664	0	0	0.012815	0	0
Marin	2023	UBUS	Aggregate	Aggregate	Natural Ga	12.55051	425.3158	50.20204	0.46653	0	0	0.003047	0	0	0.007823	0.032226	0.003185	0	0	0.031293	0.075193	1936.564	0	0	0.029626	0	0	0.394781	0	0	0.086151	0	0	0	0	0	6.153676	0	0	0	0	0	0	46.51504	0	0	0	0	0

Source: EMFAC2017 (v1.0.3) Emission Rates
Region Type: County
Region: Marin
Calendar Year: 2030
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX, RESTLOSS and DIURN

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Population	VMT	Trips	NOx_RUNE	NOx_IDLE	NOx_STRE	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_PMB	PM2.5_PMT	PM10_RUP	PM10_IDLE	PM10_STR	PM10_PMB	PM10_PMT	CO2_RUNE	CO2_IDLEX	CO2_STRE	CH4_RUNE	CH4_IDLEX	CH4_STRE	N2O_RUNE	N2O_IDLEX	N2O_STRE	ROG_RUNI	ROG_IDLEX	ROG_STRE	ROG_HOTS	ROG_RUNI	ROG_REST	ROG_DIUR	TOG_RUNE	TOG_IDLEX	TOG_STRE	TOG_HOTS	TOG_RUNI	TOG_RESTI	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
Marin	2030	HHDT	Aggregate	Aggregate	Gasoline	2.188396	232.2581	43.78544	3.15732	0	0.004206	0.000906	0	0.000294	0.005	0.02646	0.000986	0	0.000319	0.02	0.06174	1849.858	0	42.66901	0.073706	0	0.000181	0.135198	0	0.000205	0.328494	0	0.000942	0.057658	0.304966	0.016432	0.023242	0.479338	0	0.001031	0.057658	0.304966	0.016432	0.023242	30.28884	0	4.142088	0.018306	0	0.000422
Marin	2030	HHDT	Aggregate	Aggregate	Diesel	992.1764	97276.08	8830.389	2.663596	46.62899	2.582814	0.022233	0.021602	0	0.008862	0.026053	0.023238	0.022579	0	0.035447	0.060791	1234.74	8066.419	0	0.001105	0.170833	0	0.194084	1.267929	0	0.023801	3.677979	0	0	0	0	0.027095	4.187099	0	0	0	0	0	0	0.240197	53.65216	0	0.011665	0.076208	0
Marin	2030	HHDT	Aggregate	Aggregate	Natural Ga	65.05417	2653.498	253.7113	0.7777	18.87893	0	0.003637	0.01532	0	0	0.009	0.02646	0.003802	0.016012	0	0.036	0.06174	2894.331	3644.734	0	3.206631	1.192338	0	0.590028	0.743003	0	0.082406	0.026249	0	0	0	0	3.314292	1.227366	0	0	0	0	0	0	11.05836	22.00204	0	0	0	0
Marin	2030	LDA	Aggregate	Aggregate	Gasoline	144353.5	4455419	677803	0.022422	0	0.138397	0.000912	0	0.001266	0.002	0.01575	0.000992	0	0.001377	0.008	0.03675	215.4485	0	45.12003	0.001137	0	0.032406	0.003185	0	0.020615	0.003988	0	0.137321	0.071671	0.186702	0.124484	0.124412	0.416093	0	1.85101	0.002132	0	0.000446
Marin	2030	LDA	Aggregate	Aggregate	Diesel	2046.802	60847.29	9518.155	0.027878	0	0	0.002595	0	0	0.002	0.01575	0.002712	0	0	0.008	0.03675	181.4714	0	0	0.000359	0	0	0.028525	0	0	0.007724	0	0	0	0	0	0.008793	0	0	0	0	0	0	0.175472	0	0	0.001716	0	0
Marin	2030	LDA	Aggregate	Aggregate	Electricity	7248.325	275925.8	35024.95	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0	0	0	0	0	0	0	0
Marin	2030	LDT1	Aggregate	Aggregate	Gasoline	16964.77	505434.2	77868.37	0.034441	0	0.169458	0.001034	0	0.001442	0.002	0.01575	0.001125	0	0.001569	0.008	0.03675	255.8676	0	53.9808	0.001684	0	0.039913	0.003897	0	0.022807	0.006544	0	0.181214	0.113416	0.436698	0.223169	0.227929	0.00955	0	0.198406	0.113416	0.436698	0.223169	0.227929	0.504751	0	1.961025	0.002532	0	0.000534
Marin	2030	LDT1	Aggregate	Aggregate	Diesel	2.624735	64.32571	10.84799	0.184627	0	0	0.02285	0	0	0.002	0.01575	0.023884	0	0	0.008	0.03675	331.9732	0	0	0.002018	0	0	0.052182	0	0	0.043449	0	0	0	0	0	0.049463	0	0	0	0	0	0	0.35984	0	0	0.003138	0	0
Marin	2030	LDT1	Aggregate	Aggregate	Electricity	386.6936	15334.93	1893.963	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0	0	0	0	0	0	0	0
Marin	2030	LDT2	Aggregate	Aggregate	Gasoline	53235.98	1600239	245703.3	0.032758	0	0.18361	0.000966	0	0.001316	0.002	0.01575	0.001051	0	0.001432	0.008	0.03675	263.4211	0	56.94227	0.001685	0	0.045668	0.003723	0	0.024228	0.00618	0	0.202148	0.099916	0.382645	0.244419	0.223158	0.009017	0	0.221327	0.099916	0.382645	0.244419	0.223158	0.509041	0	2.42399	0.002607	0	0.000563
Marin	2030	LDT2	Aggregate	Aggregate	Diesel	606.7802	18342.98	2820.445	0.029564	0	0	0.004055	0	0	0.002	0.01575	0.004238	0	0	0.008	0.03675	253.6579	0	0	0.000636	0	0	0.039871	0	0	0.013693	0	0	0	0	0	0.015588	0	0	0	0	0	0	0.147163	0	0	0.002398	0	0
Marin	2030	LDT2	Aggregate	Aggregate	Electricity	1481.148	40311.82	7234.903	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0	0	0	0	0	0	0	0
Marin	2030	LHDT1	Aggregate	Aggregate	Gasoline	3367.256	111828.8	50167.1	0.116739	0.031315	0.403843	0.002143	0	0.000353	0.002	0.03276	0.00233	0	0.000384	0.008	0.07644	904.7971	111.4932	17.56606	0.005146	0.10368	0.016724	0.007768	0.002829	0.034504	0.022557	0.358983	0.082047	0.10917	0.945582	0.021375	0.035323	0.032915	0.523827	0.089831	0.10917	0.945582	0.021375	0.035323	0.452465	3.76382	1.592073	0.008954	0.001103	0.000174
Marin	2030	LHDT1	Aggregate	Aggregate	Diesel	3078.897	105913.4	38728.65	0.740931	1.495352	0	0.014144	0.02624	0	0.003	0.03276	0.014783	0.027427	0	0.012	0.07644	488.5145	121.2988	0	0.006485	0.005098	0	0.076788	0.019066	0	0.139628	0.10976	0	0	0	0	0.158957	0.124954	0	0	0	0	0	0	0.629833	0.909745	0	0.004618	0.001147	0
Marin	2030	LHDT2	Aggregate	Aggregate	Gasoline	488.7851	16334.66	7282.17	0.09958	0.030821	0.403779	0.001947	0	0.00029	0.002	0.03822	0.002117	0	0.000316	0.008	0.08918	1030.699	127.5441	19.76115	0.003411	0.103512	0.015488	0.007501	0.002789	0.034445	0.01312	0.353769	0.073393	0.07701	0.443912	0.017214	0.026117	0.019145	0.516219	0.080356	0.07701	0.443912	0.017214	0.026117	0.260364	3.77544	1.489121	0.0102	0.001262	0.000196
Marin	2030	LHDT2	Aggregate	Aggregate	Diesel	1143.253	39392.31	14380.69	0.508134	1.412164	0	0.017873	0.026776	0	0.003	0.03822	0.018681	0.027986	0	0.012	0.08918	543.8639	192.5606	0	0.006196	0.005098	0	0.085488	0.030268	0	0.133406	0.10976	0	0	0	0	0.151874	0.124954	0	0	0	0	0	0	0.597046	0.909745	0	0.005141	0.00182	0
Marin	2030	MCY	Aggregate	Aggregate	Gasoline	7565.494	50707.28	15130.99	1.173097	0	0.274089	0.002072	0	0.002732	0.001	0.00504	0.002221	0	0.002917	0.004	0.01176	217.2106	0	60.17452	0.334663	0	0.253258	0.067051	0	0.015413	2.251166	0	1.936167	0.662478	1.634824	0.905554	1.531205	19.24408	0	9.305814	0.002149	0	0.000595
Marin	2030	MDV	Aggregate	Aggregate	Gasoline	32365.63	953331	149235.6	0.035379	0	0.193985	0.000962	0	0.001333	0.002	0.01575	0.001046	0	0.00145	0.008	0.03675	317.9376	0	68.53386	0.001807	0	0.047982	0.003911	0	0.024583	0.006762	0	0.218412	0.107637	0.38138	0.281367	0.255649	0.009867	0	0.239133	0.107637	0.38138	0.281367	0.255649	0.518076	0	2.503384	0.003146	0	0.000678
Marin	2030	MDV	Aggregate	Aggregate	Diesel	1281.143	37800.1	5939.904	0.021529	0	0	0.002579	0	0	0.002	0.01575	0.002696	0	0	0.008	0.03675	328.2328	0	0	0.000374	0	0	0.051594	0	0	0.008049	0	0	0	0	0	0.009163	0	0	0	0	0	0	0.190343	0	0	0.003103	0	0
Marin	2030	MDV	Aggregate	Aggregate	Electricity	968.205	27140.57	4777.078	0	0	0	0	0	0	0.002	0.01575	0	0	0	0.008	0.03675	0	0	0	0	0	0	0	0	0	0	0	0.004888	0	0.003309	0.012708	0	0	0	0	0	0	0	0	0	0	0	0	0
Marin	2030	MH	Aggregate	Aggregate	Gasoline	491.3825	4909.494	49.15791	0.169641	0	0.340385	0.001301	0	0.000287	0.003	0.05586	0.001415	0	0.000312	0.012	0.13034	1532.796	0	22.65887	0.005526	0	0.02871	0.015121	0	0.038872	0.018404	0	0.109379	0.040765	0.786992	0.019036	0.043617	0.026855	0	0.119757	0.040765	0.786992	0.019036	0.043617	0.333444	0	2.416476	0.015168	0	0.000224
Marin	2030	MH	Aggregate	Aggregate	Diesel	257.1775	2266.102	25.71775	3.242828	0	0	0.054149	0	0	0.004	0.05586	0.056597	0	0	0.016	0.13034	925.3229	0	0	0.004224	0	0	0.145448	0	0	0.090938	0	0	0	0	0	0.103527	0	0	0	0	0	0	0.298469	0	0	0.008748	0	0
Marin	2030	MHDT	Aggregate	Aggregate	Gasoline	382.3255	19801.41	7649.569	0.158832	0.089337	0.339222	0.001254	0	0.000382	0.003	0.05586	0.001364	0	0.000415	0.012	0.13034	1526.696	484.2502	33.76061	0.004836	0.276984	0.033723	0.011305	0.008327	0.030325	0.02073	1.025366	0.168285	0.060605	0.325732	0.014125	0.021148	0.03025	1.496212	0.184251	0.060605	0.325732	0.014125	0.021148	0.430115	15.26345	3.540298	0.015108	0.004792	0.000334
Marin	2030	MHDT	Aggregate	Aggregate	Diesel	1608.021	75158.44	14171.86	1.684022	7.050353	2.195334	0.007748	0.003455	0	0.003	0.05586	0.008098	0.003612	0	0.012	0.13034	919.2664	1122.903	0	0.000535	0.004548	0	0.144496	0.176505	0	0.011509	0.097925	0	0	0	0	0.013102	0.11148	0	0	0	0	0	0	0.119483	3.859444	0	0.008685	0.010609	0
Marin	2030	OBUS	Aggregate	Aggregate	Gasoline	116.0852	4986.418	2322.633	0.232601	0.06522	0.31474	0.001157	0	0.000242	0.003	0.05586	0.001258	0	0.000264	0.012	0.13034	1579.034	351.864	24.3268	0.006786	0.201004	0.027751	0.014251	0.005758	0.02621	0.030455	0.74868	0.14143	0.031695	0.383477	0.018133	0.035766	0.044439	1.092472	0.154848	0.031695	0.383477	0.018133	0.035766	0.645223	5.789064	2.923146	0.015626	0.003482	0.000241
Marin	2030	OBUS	Aggregate	Aggregate	Diesel	66.58459	4818.696	653.1198	1.834213	12.93398	2.222609	0.011309	0.004223	0	0.003	0.05586	0.011821	0.004414	0	0.012	0.13034	1057.728	2606.592	0	0.000604	0.043935	0	0.16626	0.40972	0	0.012997	0.945917	0	0	0	0	0.014796	1.076854	0	0	0	0	0	0	0.14288	15.02768	0	0.009993	0.024626	0
Marin	2030	SBUS	Aggregate	Aggregate	Gasoline	53.11862	2417.489	212.4745	0.334932	0.92653	0.558713	0.001426	0	0.000648	0.002	0.3192	0.001551	0	0.000705	0.008	0.7448	779.964	2346.049	44.13699	0.008326	2.456124	0.055426	0.02013	0.092276	0.053356	0.04041	10.64152	0.314259	0.060651	0.390736	0.010961	0.021472	0.058967	15.52808	0.344074	0.060651	0.390736	0.010961	0.021472	0.891563	82.24088	7.906274	0.007718	0.023216	0.000437
Marin	2030	SBUS	Aggregate	Aggregate	Diesel	147.9348	4689.516	1707.147	5.436889	39.20963	1.156977	0.03403	0.032854	0	0.003	0.3192	0.035569	0.03434	0	0.012	0.7448	1030.671	3427.55	0	0.003986	0.011983	0	0.162007	0.538763	0	0.085817	0.257985	0	0	0	0	0.097696	0.293696	0	0	0	0	0	0	0.255878	7.260174	0	0.009737	0.032382	0
Marin	2030	UBUS	Aggregate	Aggregate	Gasoline	35.91106	3327.242	143.6443	0.273244	0	0.674036	0.002207	0	0.000758	0.002959	0.055135	0.002401	0	0.000825	0.011836	0.128648	1785.665	0	66.85533	0.006699	0	0.091049	0.023694	0	0.061278	0.02191	0	0.381991	0.024899	0.127294	0.004583	0.007598	0.031971	0	0.418232	0.024899	0.127294	0.004583	0.007598	0.350053	0	7.029465	0.017671	0	0.000662
Marin	2030	UBUS	Aggregate	Aggregate	Diesel	49.65075	2258.666	198.603	0.740514	0	0	0.005269	0	0	0.007324	0.034671	0.005507	0	0	0.029297	0.080899	1420.941	0	0	0.069495	0	0	0.223352	0	0	0.000993	0	0	0	0	0	0.070925	0	0	0	0	0	0	0.116702	0	0	0.013433	0	0
Marin	2030	UBUS	Aggregate	Aggregate	Natural Ga	20.06183	912.6345	80.24734	0.449054	0	0	0.002943	0	0	0.007324	0.034671	0.003076	0	0	0.029297	0.080899	1875.478	0	0	5.735455	0	0	0.382328	0	0	0.081948	0	0	0	0	0	5.853453	0	0	0	0	0	0	43.99535	0	0	0	0	0

Attachment 4: Project Construction Emissions and Health Risk Calculations

Neighborhood at Los Gamos, San Rafael, CA

DPM Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2021	Construction	0.1425	CON_DPM	285.0	0.08677	1.09E-02	19000	5.75E-07
2022	Construction	0.0153	CON_DPM	30.7	0.00933	1.18E-03	19000	6.19E-08
Total		***0.1578***		***315.7***	***0.0961***	***0.0121***		

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

PM2.5 Fugitive Dust 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)	PM2.5 Emission Rate $g/s/m^2$
2021	Construction	CON_FUG	0.0855	171.0	0.05206	6.56E-03	19,000	3.45E-07
2022	Construction	CON_FUG	0.0005	1.0	0.00030	3.74E-05	19,000	1.97E-09
Total			***0.0860***	***172.0***	***0.0524***	***0.0066***		

Construction Hours

hr/day =	9	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

Neighborhood at Los Gamos, San Rafael, CA - Construction Health Impact Sum

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	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2021	0.0151	0.0095	2.68	0.003	0.02
2022	0.0016	0.0001	0.27	0.0003	0.002
Total	-	-	**2.9**	-	-
Maximum	0.0151	0.0095	**-**	**0.003**	**0.02**

Neighborhood at Los Gamos, San Rafael, 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				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	0.0148	10	0.20	2021	0.0148	-	-			
1	1	0 - 1	2021	0.0148	10	2.42	2021	0.0148	1	0.04	0.0030	0.0092	0.0239
2	1	1 - 2	2022	0.0016	10	0.26	2022	0.0016	1	0.00	0.0003	0.0001	0.0016
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						**2.9**				**0.05**			

* Third trimester of pregnancy

Neighborhood at Los Gamos, San Rafael, 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 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	0.0151	10	0.20	2021	0.0151	-	-			
1	1	0 - 1	2021	0.0151	10	2.47	2021	0.0151	1	0.04	0.0030	0.0095	0.0245
2	1	1 - 2	2022	0.0016	10	0.27	2022	0.0016	1	0.00	0.0003	0.0001	0.0017
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						**2.9**				**0.05**			

* Third trimester of pregnancy

Attachment 5: Community Risk Modeling Information and Calculations

CT-EMFAC2017 Emissions Factors for U.S. 101

File Name: Los Gamos Neightborhood - Marin (SF) - 2021 - Annual.EF
CT-EMFAC2017 V1.0.2.27401
Run Date: 11/2/2020 16:36
Area: Marin (SF)
Analysis Year: 2021
Season: Annual

Vehicle Category	VMT Fraction Across Category	Diesel VMT Fraction Within Category	Gas VMT Fraction Within Category
Truck 1	0.024	0.489	0.511
Truck 2	0.02	0.878	0.104
Non-Truck	0.956	0.019	0.961

Road Type: Freeway

Silt Loading Fa	CARB	0.015 g/m2	
Precipitation Cor	CARB	P = 66 days	N = 365 days

Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

Pollutant Nan	<= 5 mph	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph	65 mph	70 mph
PM2.5	0.013023	0.00896	0.006188	0.004455	0.003471	0.002877	0.002518	0.002332	0.002283	0.002354	0.002538	0.002762	0.003011	0.003142
TOG	0.280646	0.185882	0.122673	0.084944	0.063937	0.050851	0.042412	0.03712	0.034129	0.033004	0.033593	0.036002	0.04052	0.043783
Diesel PM	0.004033	0.003304	0.002429	0.00182	0.001526	0.001366	0.001281	0.001264	0.001312	0.001422	0.001595	0.001739	0.001829	0.001829

Fleet Average Fuel Consumption (gallons/veh-mile)

Fuel Type	<= 5 mph	10 mph	15 mph	20 mph	25 mph	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph	65 mph	70 mph
Gasoline	0.082415	0.066844	0.054667	0.045512	0.038907	0.034513	0.031992	0.030957	0.030981	0.031894	0.033236	0.034555	0.035572	0.035572
Diesel	0.008233	0.006967	0.005424	0.004632	0.004064	0.003624	0.00334	0.003123	0.002987	0.002969	0.003037	0.003163	0.003371	0.003371

Fleet Average Running Loss Emission Factors (grams/veh-hour)

Pollutant Name	Emission Factor
TOG	1.698221

Fleet Average Tire Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.002089

Fleet Average Brake Wear Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.016968

Fleet Average Road Dust Factors (grams/veh-mile)

Pollutant Name	Emission Factor
PM2.5	0.00755

END

U.S. 101 Traffic Emissions and Health Risk Calculations – Construction MEI and Project Receptors

Analysis Year = ***2021***

Vehicle Type	**2018 Caltrans Vehicles (veh/day)**	**2021 Vehicles (veh/day)**
Truck 1 (MDT)	4,507	4,642
Truck 2 (HDT)	3,901	4,019
Non-Truck	182,692	188,172
Total	**191,100**	**196,833**

Increase From 2018	1.03
Vehicles/Direction	**98,417**
Avg Vehicles/Hour/Direction	4,101

Traffic Data Year = ***2018***

Caltrans AADT (2017) & Truck %s (2018)	AADT Total	Total Truck	Trucks by Axle 2	3	4	5
Rte 82, B Belmont, Ralston Ave	191,100	8,408	4,507	1,110	244	2,548
Rte 82, B Redwood City/San Carlos City Limits			53.60%	13.20%	2.90%	30.30%
Percent of Total Vehicles		4.40%	2.36%	0.58%	0.13%	1.33%

Traffic Increase per Year (%) = *1.00%*

Los Gamos Neighborhood - On- and Off-site Residential Receptors
Cumulative Operation - U.S. Highway 101
DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
DPM_NB_101	U.S. 101 Northbound	NB	4	716.3	0.45	20.6	67.7	3.4	65	98,417
DPM_SB_101	U.S. 101 Southbound	SB	4	743.9	0.46	20.6	67.7	3.4	65	98,417
									Total	196,833

Emission Factors

Speed Category	1	2	3	4
Travel Speed (mph)	65	30		
Emissions per Vehicle (g/VMT)	0.00183	0.001366		

Emisson Factors from CT-EMFAC2017

2021 Hourly Traffic Volumes and DPM Emissions - DPM_NB_101

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	3.32%	3267	7.39E-04	9	6.78%	6673	1.51E-03	17	6.78%	6673	1.13E-03
2	2.49%	2451	5.54E-04	10	7.05%	6938	1.57E-03	18	4.70%	4626	7.81E-04
3	2.49%	2451	5.54E-04	11	5.39%	5305	1.20E-03	19	2.90%	2854	6.45E-04
4	1.66%	1634	3.69E-04	12	6.64%	6535	1.48E-03	20	1.24%	1220	2.76E-04
5	2.07%	2037	4.61E-04	13	6.22%	6122	1.38E-03	21	3.32%	3267	7.39E-04
6	2.49%	2451	5.54E-04	14	6.22%	6122	1.38E-03	22	4.15%	4084	9.24E-04
7	4.56%	4488	1.01E-03	15	5.95%	5856	1.32E-03	23	3.32%	3267	7.39E-04
8	4.29%	4222	9.55E-04	16	5.12%	5039	1.14E-03	24	0.83%	817	1.85E-04
								Total		98,397	

2021 Hourly Traffic Volumes Per Direction and DPM Emissions - DPM_SB_101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	3.32%	3267	7.67E-04	9	6.78%	6673	1.17E-03	17	6.78%	6673	1.57E-03
2	2.49%	2451	5.75E-04	10	7.05%	6938	1.63E-03	18	4.70%	4626	1.09E-03
3	2.49%	2451	5.75E-04	11	5.39%	5305	1.25E-03	19	2.90%	2854	6.70E-04
4	1.66%	1634	3.84E-04	12	6.64%	6535	1.53E-03	20	1.24%	1220	2.87E-04
5	2.07%	2037	4.78E-04	13	6.22%	6122	1.44E-03	21	3.32%	3267	7.67E-04
6	2.49%	2451	5.75E-04	14	6.22%	6122	1.44E-03	22	4.15%	4084	9.59E-04
7	4.56%	4488	1.05E-03	15	5.95%	5856	1.38E-03	23	3.32%	3267	7.67E-04
8	4.29%	4222	7.41E-04	16	5.12%	5039	1.18E-03	24	0.83%	817	1.92E-04
								Total		98,397	

Los Gamos Neighborhood - On- and Off-site Residential Receptors
Cumulative Operation - U.S. Highway 101
PM2.5 Modeling - Roadway Links, Traffic Volumes, and PM2.5 Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
PM2.5_NB_101	U.S. 101 Northbound	NB	4	716.3	0.45	20.6	68	1.3	65	98,417
PM2.5_SB_101	U.S. 101 Southbound	SB	4	743.9	0.46	20.6	68	1.3	65	98,417
									Total	196,833

Emission Factors - PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	65	30		
Emissions per Vehicle (g/VMT)	0.003011	0.00288		

Emisson Factors from CT-EMFAC2017

2021 Hourly Traffic Volumes and PM2.5 Emissions - PM2.5_NB_101

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.13%	1112	4.14E-04	9	7.12%	7007	2.61E-03	17	7.42%	7303	2.60E-03
2	0.43%	423	1.58E-04	10	4.38%	4311	1.60E-03	18	8.20%	8070	2.87E-03
3	0.39%	384	1.43E-04	11	4.65%	4576	1.70E-03	19	5.68%	5590	2.08E-03
4	0.21%	207	7.69E-05	12	5.90%	5807	2.16E-03	20	4.31%	4242	1.58E-03
5	0.50%	492	1.83E-04	13	6.18%	6082	2.26E-03	21	3.24%	3189	1.19E-03
6	0.89%	876	3.26E-04	14	6.07%	5974	2.22E-03	22	3.30%	3248	1.21E-03
7	3.73%	3671	1.37E-03	15	7.02%	6909	2.57E-03	23	2.46%	2421	9.01E-04
8	7.74%	7617	2.84E-03	16	7.17%	7056	2.63E-03	24	1.88%	1850	6.89E-04
								Total		98,417	

2021 Hourly Traffic Volumes Per Direction and PM2.5 Emissions - PM2.5_SB_101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.13%	1112	4.30E-04	9	7.12%	7007	2.59E-03	17	7.42%	7303	2.82E-03
2	0.43%	423	1.64E-04	10	4.38%	4311	1.67E-03	18	8.20%	8070	3.12E-03
3	0.39%	384	1.48E-04	11	4.65%	4576	1.77E-03	19	5.68%	5590	2.16E-03
4	0.21%	207	7.99E-05	12	5.90%	5807	2.24E-03	20	4.31%	4242	1.64E-03
5	0.50%	492	1.90E-04	13	6.18%	6082	2.35E-03	21	3.24%	3189	1.23E-03
6	0.89%	876	3.39E-04	14	6.07%	5974	2.31E-03	22	3.30%	3248	1.26E-03
7	3.73%	3671	1.42E-03	15	7.02%	6909	2.67E-03	23	2.46%	2421	9.36E-04
8	7.74%	7617	2.81E-03	16	7.17%	7056	2.73E-03	24	1.88%	1850	7.15E-04
								Total		98,417	

Los Gamos Neighborhood - On- and Off-site Residential Receptors
Cumulative Operation - U.S. Highway 101
TOG Exhaust Modeling - Roadway Links, Traffic Volumes, and TOG Exhaust Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEXH_NB_101	U.S. 101 Northbound	NB	4	716.3	0.45	20.6	68	1.3	65	98,417
TEXH_SB_101	U.S. 101 Southbound	SB	4	743.9	0.46	20.6	68	1.3	65	98,417
									Total	196,833

Emission Factors - TOG Exhaust

Speed Category	1	2	3	4
Travel Speed (mph)	65	30		
Emissions per Vehicle (g/VMT)	0.04052	0.05085		

Emisson Factors from CT-EMFAC2017

2021 Hourly Traffic Volumes and TOG Exhaust Emissions - TEXH_NB_101

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.13%	1112	5.57E-03	9	7.12%	7007	3.51E-02	17	7.42%	7303	4.59E-02
2	0.43%	423	2.12E-03	10	4.38%	4311	2.16E-02	18	8.20%	8070	5.07E-02
3	0.39%	384	1.92E-03	11	4.65%	4576	2.29E-02	19	5.68%	5590	2.80E-02
4	0.21%	207	1.04E-03	12	5.90%	5807	2.91E-02	20	4.31%	4242	2.12E-02
5	0.50%	492	2.47E-03	13	6.18%	6082	3.05E-02	21	3.24%	3189	1.60E-02
6	0.89%	876	4.39E-03	14	6.07%	5974	2.99E-02	22	3.30%	3248	1.63E-02
7	3.73%	3671	1.84E-02	15	7.02%	6909	3.46E-02	23	2.46%	2421	1.21E-02
8	7.74%	7617	3.82E-02	16	7.17%	7056	3.54E-02	24	1.88%	1850	9.27E-03
								Total		98,417	

2021 Hourly Traffic Volumes Per Direction and TOG Exhaust Emissions - TEXH_SB_101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.13%	1112	5.79E-03	9	7.12%	7007	4.58E-02	17	7.42%	7303	3.80E-02
2	0.43%	423	2.20E-03	10	4.38%	4311	2.24E-02	18	8.20%	8070	4.20E-02
3	0.39%	384	2.00E-03	11	4.65%	4576	2.38E-02	19	5.68%	5590	2.91E-02
4	0.21%	207	1.08E-03	12	5.90%	5807	3.02E-02	20	4.31%	4242	2.21E-02
5	0.50%	492	2.56E-03	13	6.18%	6082	3.16E-02	21	3.24%	3189	1.66E-02
6	0.89%	876	4.56E-03	14	6.07%	5974	3.11E-02	22	3.30%	3248	1.69E-02
7	3.73%	3671	1.91E-02	15	7.02%	6909	3.59E-02	23	2.46%	2421	1.26E-02
8	7.74%	7617	4.97E-02	16	7.17%	7056	3.67E-02	24	1.88%	1850	9.63E-03
								Total		98,417	

Los Gamos Neighborhood - On- and Off-site Residential Receptors
Cumulative Operation - U.S. Highway 101
TOG Evaporative Emissions Modeling - Roadway Links, Traffic Volumes, and TOG Evaporative Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
TEVAP_NB_101	U.S. 101 Northbound	NB	4	716.3	0.45	20.6	68	1.3	65	98,417
TEVAP_SB_101	U.S. 101 Southbound	SB	4	743.9	0.46	20.6	68	1.3	65	98,417
									Total	196,833

Emission Factors - PM2.5 - Evaporative TOG

Speed Category	1	2	3	4
Travel Speed (mph)	65	30		
Emissions per Vehicle per Hour (g/hour)	1.69822	1.69822		
Emissions per Vehicle per Mile (g/VMT)	0.02613	0.05661		

Emisson Factors from CT-EMFAC2017

2021 Hourly Traffic Volumes and TOG Evaporative Emissions - TEVAP_NB_101

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.13%	1112	3.59E-03	9	7.12%	7007	2.26E-02	17	7.42%	7303	5.11E-02
2	0.43%	423	1.37E-03	10	4.38%	4311	1.39E-02	18	8.20%	8070	5.65E-02
3	0.39%	384	1.24E-03	11	4.65%	4576	1.48E-02	19	5.68%	5590	1.81E-02
4	0.21%	207	6.68E-04	12	5.90%	5807	1.88E-02	20	4.31%	4242	1.37E-02
5	0.50%	492	1.59E-03	13	6.18%	6082	1.96E-02	21	3.24%	3189	1.03E-02
6	0.89%	876	2.83E-03	14	6.07%	5974	1.93E-02	22	3.30%	3248	1.05E-02
7	3.73%	3671	1.19E-02	15	7.02%	6909	2.23E-02	23	2.46%	2421	7.82E-03
8	7.74%	7617	2.46E-02	16	7.17%	7056	2.28E-02	24	1.88%	1850	5.98E-03
								Total		98,417	

2021 Hourly Traffic Volumes Per Direction and TOG Evaporative Emissions - TEVAP_SB_101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.13%	1112	3.73E-03	9	7.12%	7007	5.09E-02	17	7.42%	7303	2.45E-02
2	0.43%	423	1.42E-03	10	4.38%	4311	1.45E-02	18	8.20%	8070	2.71E-02
3	0.39%	384	1.29E-03	11	4.65%	4576	1.54E-02	19	5.68%	5590	1.88E-02
4	0.21%	207	6.93E-04	12	5.90%	5807	1.95E-02	20	4.31%	4242	1.42E-02
5	0.50%	492	1.65E-03	13	6.18%	6082	2.04E-02	21	3.24%	3189	1.07E-02
6	0.89%	876	2.94E-03	14	6.07%	5974	2.00E-02	22	3.30%	3248	1.09E-02
7	3.73%	3671	1.23E-02	15	7.02%	6909	2.32E-02	23	2.46%	2421	8.12E-03
8	7.74%	7617	5.54E-02	16	7.17%	7056	2.37E-02	24	1.88%	1850	6.21E-03
								Total		98,417	

Los Gamos Neighborhood - On- and Off-site Residential Receptors
Cumulative Operation - U.S. Highway 101
Fugitive Road PM2.5 Modeling - Roadway Links, Traffic Volumes, and Fugitive Road PM2.5 Emissions
Year = 2021

Road Link	Description	Direction	No. Lanes	Link Length (m)	Link Length (mi)	Link Width (m)	Link Width (ft)	Release Height (m)	Average Speed (mph)	Average Vehicles per Day
FUG_NB_101	U.S. 101 Northbound	NB	4	716.3	0.45	20.6	68	1.3	65	98,417
FUG_SB_101	U.S. 101 Southbound	SB	4	743.9	0.46	20.6	68	1.3	65	98,417
									Total	196,833

Emission Factors - Fugitive PM2.5

Speed Category	1	2	3	4
Travel Speed (mph)	65	30		
Tire Wear - Emissions per Vehicle (g/VMT)	0.00209	0.00209		
Brake Wear - Emissions per Vehicle (g/VMT)	0.01697	0.01697		
Road Dust - Emissions per Vehicle (g/VMT)	0.00755	0.00755		
Total Fugitive PM2.5 - Emissions per Vehicle (g/VMT)	0.02661	0.02661		

Emisson Factors from CT-EMFAC2017

2021 Hourly Traffic Volumes and Fugitive PM2.5 Emissions - FUG_NB_101

Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s	Hour	% Per Hour	VPH	g/s
1	1.13%	1112	3.66E-03	9	7.12%	7007	2.31E-02	17	7.42%	7303	2.40E-02
2	0.43%	423	1.39E-03	10	4.38%	4311	1.42E-02	18	8.20%	8070	2.65E-02
3	0.39%	384	1.26E-03	11	4.65%	4576	1.51E-02	19	5.68%	5590	1.84E-02
4	0.21%	207	6.80E-04	12	5.90%	5807	1.91E-02	20	4.31%	4242	1.40E-02
5	0.50%	492	1.62E-03	13	6.18%	6082	2.00E-02	21	3.24%	3189	1.05E-02
6	0.89%	876	2.88E-03	14	6.07%	5974	1.97E-02	22	3.30%	3248	1.07E-02
7	3.73%	3671	1.21E-02	15	7.02%	6909	2.27E-02	23	2.46%	2421	7.96E-03
8	7.74%	7617	2.51E-02	16	7.17%	7056	2.32E-02	24	1.88%	1850	6.09E-03
								Total		98,417	

2021 Hourly Traffic Volumes Per Direction and Fugitive PM2.5 Emissions - FUG_SB_101

Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile	Hour	% Per Hour	VPH	g/mile
1	1.13%	1112	3.80E-03	9	7.12%	7007	2.39E-02	17	7.42%	7303	2.49E-02
2	0.43%	423	1.45E-03	10	4.38%	4311	1.47E-02	18	8.20%	8070	2.76E-02
3	0.39%	384	1.31E-03	11	4.65%	4576	1.56E-02	19	5.68%	5590	1.91E-02
4	0.21%	207	7.06E-04	12	5.90%	5807	1.98E-02	20	4.31%	4242	1.45E-02
5	0.50%	492	1.68E-03	13	6.18%	6082	2.08E-02	21	3.24%	3189	1.09E-02
6	0.89%	876	2.99E-03	14	6.07%	5974	2.04E-02	22	3.30%	3248	1.11E-02
7	3.73%	3671	1.25E-02	15	7.02%	6909	2.36E-02	23	2.46%	2421	8.27E-03
8	7.74%	7617	2.60E-02	16	7.17%	7056	2.41E-02	24	1.88%	1850	6.32E-03
								Total		98,417	

Los Gamos Neighborhood, San Rafael, CA - S. U.S Highway 101 Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
at Construction MEI Receptor (4.5 meter receptor height)

Emission Year	2021
Receptor Information	Construction MEI receptor
Number of Receptors	1
Receptor Height	4.5 meters
Receptor Distances	At Construction MEI location
Meteorological Conditions	
BAAQMD Gnoss Air Field Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Winf Direction	Variable

Construction MEI Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.05081	1.15921	0.8513

Construction MEI PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.81613	0.73348	0.08265

Los Gamos Neighborhood, San Rafael, CA - U.S. Highway 101 Traffic Cancer Risk
Impacts at Construction MEI - 4.5 meter receptor height
30 Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2021	10	0.0508	1.1592	0.8513	0.691	0.090	0.0039	0.78
1	1	0 - 1	2021	10	0.0508	1.1592	0.8513	8.345	1.087	0.0470	9.48
2	1	1 - 2	2022	10	0.0508	1.1592	0.8513	8.345	1.087	0.0470	9.48
3	1	2 - 3	2023	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
4	1	3 - 4	2024	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
5	1	4 - 5	2025	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
6	1	5 - 6	2026	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
7	1	6 - 7	2027	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
8	1	7 - 8	2028	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
9	1	8 - 9	2029	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
10	1	9 - 10	2030	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
11	1	10 - 11	2031	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
12	1	11 - 12	2032	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
13	1	12 - 13	2033	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
14	1	13 - 14	2034	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
15	1	14 - 15	2035	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
16	1	15 - 16	2036	3	0.0508	1.1592	0.8513	1.314	0.171	0.0074	1.49
17	1	16-17	2037	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
18	1	17-18	2038	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
19	1	18-19	2039	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
20	1	19-20	2040	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
21	1	20-21	2041	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
22	1	21-22	2042	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
23	1	22-23	2043	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
24	1	23-24	2044	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
25	1	24-25	2045	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
26	1	25-26	2046	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
27	1	26-27	2047	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
28	1	27-28	2048	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
29	1	28-29	2049	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
30	1	29-30	2050	1	0.0508	1.1592	0.8513	0.146	0.019	0.0008	0.17
Total Increased Cancer Risk								37.82	4.926	0.213	**43.0**

Maximum Hazard Index	Fugitive PM2.5	Total PM2.5
0.010	0.73	0.82

* Third trimester of pregnancy

Los Gamos Neighborhood, San Rafael, CA - S. U.S Highway 101 Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site 1st Floor Residential Receptors (1.5 meter receptor height)

Emission Year	2021
Receptor Information	Maximum On-Site Receptor
Number of Receptors	141
Receptor Height	1.5 meters
Receptor Distances	7 meter grid spacing in residential areas

Meteorological Conditions	
BAAQMD Gnoss Air Field Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Winf Direction	Variable

1st Floor Project Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.01977	0.45915	0.33733

1st Floor Project PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.32321	0.29048	0.03273

Los Gamos Neighborhood, San Rafael, CA - U.S. Highway 101 Traffic Cancer Risk
Impacts at On-Site 1st Floor Residential Receptors - 1.5 meter receptor height
30 Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2021	10	0.0198	0.4592	0.3373	0.269	0.036	0.0015	0.31
1	1	0 - 1	2021	10	0.0198	0.4592	0.3373	3.247	0.431	0.0186	3.70
2	1	1 - 2	2022	10	0.0198	0.4592	0.3373	3.247	0.431	0.0186	3.70
3	1	2 - 3	2023	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
4	1	3 - 4	2024	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
5	1	4 - 5	2025	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
6	1	5 - 6	2026	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
7	1	6 - 7	2027	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
8	1	7 - 8	2028	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
9	1	8 - 9	2029	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
10	1	9 - 10	2030	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
11	1	10 - 11	2031	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
12	1	11 - 12	2032	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
13	1	12 - 13	2033	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
14	1	13 - 14	2034	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
15	1	14 - 15	2035	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
16	1	15 - 16	2036	3	0.0198	0.4592	0.3373	0.511	0.068	0.0029	0.58
17	1	16-17	2037	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
18	1	17-18	2038	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
19	1	18-19	2039	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
20	1	19-20	2040	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
21	1	20-21	2041	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
22	1	21-22	2042	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
23	1	22-23	2043	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
24	1	23-24	2044	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
25	1	24-25	2045	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
26	1	25-26	2046	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
27	1	26-27	2047	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
28	1	27-28	2048	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
29	1	28-29	2049	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
30	1	29-30	2050	1	0.0198	0.4592	0.3373	0.057	0.008	0.0003	0.06
Total Increased Cancer Risk								14.71	1.951	0.084	**16.8**

Maximum Hazard Index	Fugitive PM2.5	Total PM2.5
0.0040	0.29	0.32

* Third trimester of pregnancy

Los Gamos Neighborhood, San Rafael, CA - S. U.S Highway 101 Traffic - TACs & PM2.5
AERMOD Risk Modeling Parameters and Maximum Concentrations
On-Site 2nd Floor Residential Receptors (6 meter receptor height)

Emission Year	2021
Receptor Information	Maximum On-Site Receptor
Number of Receptors	141
Receptor Height	6 meters
Receptor Distances	7 meter grid spacing in residential areas
Meteorological Conditions	
BAAQMD Gnoss Air Field Met Data	2013-2017
Land Use Classification	Urban
Wind Speed	Variable
Winf Direction	Variable

2nd Floor Project Cancer Risk Maximum Concentrations

Meteorological Data Years	Concentration (µg/m3)*		
	DPM	Exhaust TOG	Evaporative TOG
2013-2017	0.01511	0.32702	0.23997

2nd Floor Project PM2.5 Maximum Concentrations

Meteorological Data Years	PM2.5 Concentration (µg/m3)*		
	Total PM2.5	Fugitive PM2.5	Vehicle PM2.5
2013-2017	0.23029	0.20697	0.02332

Los Gamos Neighborhood, San Rafael, CA - U.S. Highway 101 Traffic Cancer Risk
Impacts at On-Site 2nd Floor Residential Receptors - 6 meter receptor height
30 Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00
Vehicle TOG Exhaust	6.28E-03
Vehicle TOG Evaporative	3.70E-04

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Maximum - Exposure Information					Concentration (ug/m3)			Cancer Risk (per million)			TOTAL
Exposure Year	Exposure Duration (years)	Age	Year	Age Sensitivity Factor	DPM	Exhaust TOG	Evaporative TOG	DPM	Exhaust TOG	Evaporative TOG	
0	0.25	-0.25 - 0*	2021	10	0.0151	0.3270	0.2400	0.205	0.025	0.0011	0.23
1	1	0 - 1	2021	10	0.0151	0.3270	0.2400	2.482	0.307	0.0133	2.80
2	1	1 - 2	2022	10	0.0151	0.3270	0.2400	2.482	0.307	0.0133	2.80
3	1	2 - 3	2023	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
4	1	3 - 4	2024	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
5	1	4 - 5	2025	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
6	1	5 - 6	2026	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
7	1	6 - 7	2027	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
8	1	7 - 8	2028	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
9	1	8 - 9	2029	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
10	1	9 - 10	2030	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
11	1	10 - 11	2031	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
12	1	11 - 12	2032	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
13	1	12 - 13	2033	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
14	1	13 - 14	2034	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
15	1	14 - 15	2035	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
16	1	15 - 16	2036	3	0.0151	0.3270	0.2400	0.391	0.048	0.0021	0.44
17	1	16-17	2037	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
18	1	17-18	2038	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
19	1	18-19	2039	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
20	1	19-20	2040	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
21	1	20-21	2041	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
22	1	21-22	2042	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
23	1	22-23	2043	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
24	1	23-24	2044	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
25	1	24-25	2045	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
26	1	25-26	2046	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
27	1	26-27	2047	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
28	1	27-28	2048	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
29	1	28-29	2049	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
30	1	29-30	2050	1	0.0151	0.3270	0.2400	0.043	0.005	0.0002	0.05
Total Increased Cancer Risk								11.25	1.390	0.060	**12.7**

Maximum Hazard Index	Maximum Fugitive PM2.5	Total PM2.5
0.0030	0.21	0.23

* Third trimester of pregnancy

Bay Area Air Quality Management District

Risk & Hazard Stationary Source Inquiry Form

This form is required when users request stationary source data from BAAQMD

This form is to be used with the BAAQMD's Google Earth stationary source screening tables.

Click here for guidance on coducting risk & hazard screening, including roadways & freeways, refer to the District's Risk & Hazard Analysis flow chart.

Click here for District's Recommended Methods for Screening and Modeling Local Risks and Hazards document.

Table A: Requester Contact Information

Date of Request	**9/24/2020**
Contact Name	Casey Divine
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-0400 x103
Email	cdivine@illingworthrodkin.com
Project Name	Los Gamos Neighborhood
Address	West of 1401 Los Gamos Drive
City	San Rafael
County	Marin
Type (residential, commercial, mixed use, industrial, etc.)	Mixed Use
Project Size (# of units or building square feet)	192du, 4.5ksf retail
Comments:	

For Air District assistance, the following steps must be completed:

1. Complete all the contact and project information requested in Table A ncomplete forms will not be processed. Please include a project site map.

2. Download and install the free program Google Earth, **http://www.google.com/earth/download/ge/,** and then download the county specific Google Earth stationary source application files from the District's website, **http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx.** The small points on the map represent stationary sources permitted by the District (Map A on right). These permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc. Click on a point to view the source's Information Table, including the name, location, and preliminary estimated cancer risk, hazard index, and PM2.5 concentration.

3. Find the project site in Google Earth by inputting the site's address in the Google Earth search box.

4. Identify stationary sources within at least a 1000ft radius of project site. Verify that the location of the source on the map matches with the source's address in the Information Table, by using the Google Earth address search box to confirm the source's address location. Please report any mapping errors to the District.

5. List the stationary source information in Table B lue section only.

6. Note that a small percentage of the stationary sources have Health Risk Screening Assessment (HRSA) data INSTEAD of screening level data. These sources will be noted by an asterisk next to the Plant Name (Map B on right). If HRSA values are presented, these values have already been modeled and cannot be adjusted further.

7. Email this completed form to District staff. District staff will provide the most recent risk, hazard, and PM2.5 data that are available for the source(s). If this information or data are not available, source emissions data will be provided. Staff will respond to inquiries within three weeks.

Note that a public records request received for the same stationary source information will cancel the processing of your SSIF request.

Submit forms, maps, and questions to Areana Flores at 415-749-4616, or aflores@baaqmd.gov

Table B: Google Earth data

Distance from Receptor (feet) or MEI[1]	Plant No.	Facility Name	Address	Cancer Risk[2]	Hazard Risk[2]	$PM_{2.5}$[2]	Source No.[3]	Type of Source[4]	Fuel Code[5]	Status/Comments
520	16219	Fairchild Semiconductor Corp c/o Weiss Associates	4300 Redwood Highway	0.04	--	--		Sub-Slab Depressurization		2018 Dataset
570	20504	Las Gallinas Valley Sanitary District	4238 Redwod Hwy Frntg Rd	3.67	--	--		Generators		2018 Dataset
1000	22566	County of Marin c/o Sares Regis	1600 Los Gamos Drive	115.86	0.19	0.59		Generator (2), Boiler (2)		2018 Dataset

Construction MEI

Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
0.33	0.01	#VALUE!	#VALUE!
0.09	0.3	#VALUE!	#VALUE!
0.04	4.6	0.01	0.02

Project Site

Distance from Receptor (feet) or MEI[1]	FACID (Plant No.)	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
625	16219	0.27	0.01	#VALUE!	#VALUE!
880	20504	0.05	0.2	#VALUE!	#VALUE!
1000	22566	0.04	4.6	0.01	0.02

Footnotes:

1. Maximally exposed individual
2. These Cancer Risk, Hazard Index, and PM2.5 columns represent the values in the Google Earth Plant Information Table.
3. Each plant may have multiple permits and sources.
4. Permitted sources include diesel back-up generators, gas stations, dry cleaners, boilers, printers, auto spray booths, etc.
5. Fuel codes: 98 = diesel, 189 = Natural Gas.
6. If a Health Risk Screening Assessment (HRSA) was completed for the source, the application number will be listed here.
7. The date that the HRSA was completed.
8. Engineer who completed the HRSA. For District purposes only.
9. All HRSA completed before 1/5/2010 need to be multiplied by an age sensitivity factor of 1.7.
10. The HRSA "Chronic Health" number represents the Hazard Index.
11. Further information about common sources:
    a. Sources that only include diesel internal combustion engines can be adjusted using the BAAQMD's Diesel Multiplier worksheet.
    b. The risk from natural gas boilers used for space heating when <25 MM BTU/hr would have an estimated cancer risk of one in a million or less, and a chronic hazard index of
    c. BAAQMD Reg 11 Rule 16 required that all co-residential (sharing a wall, floor, ceiling or is in the same building as a residential unit) dry cleaners cease use of perc on July 1, 2010. Therefore, there is no cancer risk, hazard or PM2.5 concentrations from co-residential dry cleaning businesses in the BAAQMD.
    d. Non co-residential dry cleaners must phase out use of perc by Jan. 1, 2023. Therefore, the risk from these dry cleaners does not need to be factored in over a 70-year period, but instead
    e. Gas stations can be adjusted using BAAQMD's Gas Station Distance Mulitplier worksheet.
    f. Unless otherwise noted, exempt sources are considered insignificant. See BAAQMD Reg 2 Rule 1 for a list of exempt sources.
    g. This spray booth is considered to be insignificant.

Date last updated:
03/13/2018