SILICON SAGE AIR QUALITY & GREENHOUSE GAS EMISSIONS ASSESSMENT

Fremont, California

October 15, 2017
Revised June 7, 2018

Prepared for:

Ingrid Rademaker
City of Fremont
39550 Liberty Street
Fremont, CA 94538

Prepared by:

James A. Reyff and
William Popenuck

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
1 Willowbrook Court, Suite 120
Petaluma, CA 94954
(707) 794-0400

Project: 17-152

Introduction

The purpose of this report is to address air quality and greenhouse (GHG) impacts associated with the proposed mixed-use residential development project. The proposed project would demolish existing buildings located from 37358 - 37494 Fremont Boulevard and 3768 - 3820 Peralta Boulevard, and would construct a new mixed-use development featuring two multi-story buildings containing a combined 25,000 square feet (sf) of ground-floor commercial space with 64 apartment units and 72 townhomes.

Air pollutant and GHG emissions associated with construction and operation of the project were modeled. In addition, the potential construction health risk impacts to nearby sensitive receptors were evaluated, along with the community risk impacts of existing toxic air contaminant (TAC) sources upon future project residences. This analysis addresses those issues following the guidance provided by the Bay Area Air Quality Management District (BAAQMD).

Setting

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

Air Pollutants of Concern

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

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

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 OEHHA risk assessment guidelines were published in February of 2015.[1] See *Attachment 1* for a detailed description of the community risk modeling methodology used in this assessment.

Regulatory Setting

Federal Regulations

The United States Environmental Protection Agency (EPA) sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, industrial, and mining activities (such as bulldozers and loaders). The EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, as long as they are the same or more stringent than the Federal standards.

In the past decade the EPA has established a number of emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of 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 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards.[2]

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The new

[1] 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.
[2] USEPA, 2000. *Regulatory Announcement, Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*. EPA420-F-00-057. December.

standards reduced the amount of sulfur allowed by 97 percent for highway diesel fuel (from 500 parts per million by weight [ppmw] to 15 ppmw), and by 99 percent for off-highway diesel fuel (from about 3,000 ppmw to 15 ppmw). The low sulfur highway fuel (15 ppmw sulfur), also called ultra-low sulfur diesel (ULSD) is currently required for use by all vehicles in the U.S.

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

State Regulations

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles[3]. In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. Many of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the Federal on-road and non-road diesel engine emission standards for new engines, as well as adoption of regulations for low sulfur fuel in California.

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

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

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

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 *CEQA Air Quality Guidelines*[4] 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. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of their *CEQA Guidelines*. In May 2011, the updated BAAQMD *CEQA Air Quality Guidelines* were amended to include a risk and hazards threshold for new receptors and modify procedures for assessing impacts related to risk and hazard impacts.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The closest sensitive receptors to the project site are residences north of the project site on Jason Way, with additional nearby residences to the east, north, and south of the project site. There are also several preschools and a school in the project vicinity. These include the Holy Spirit preschool and school located across from the site to the east on Parish Avenue, A Childs Hideaway preschool southeast from the site on Fremont Boulevard, and the Genius Kids preschool northeast of the project site on Peralta Boulevard.

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

Significance Thresholds

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA. The significance thresholds identified by BAAQMD and used in this analysis are summarized in Table 1. The BAAQMD's adoption of significance thresholds contained in the 2011 *CEQA Air Quality Guidelines* was called into question by an order issued March 5, 2012, in California Building Industry Association (CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires the BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds (Cal. Court of Appeal, First Appellate District, Case Nos. A135335 & A136212). CBIA sought review by the California Supreme Court on three issues, including the appellate court's decision to uphold the BAAQMD's adoption of the thresholds, and the Court granted review on just one: Under what circumstances, if any, does CEQA require an analysis of how existing environmental conditions will impact future residents or users of a proposed project? In December 2015, the Supreme Court determined that an analysis of the impacts of the environment on a project – known as "CEQA-in-reverse" – is only required under two limited circumstances: (1) when a statute provides an express legislative directive to consider such impacts; and (2) when a proposed project risks exacerbating environmental hazards or conditions that already exist (Cal. Supreme Court Case No. S213478). The Supreme Court reversed the Court of Appeal's decision and remanded the matter back to the appellate court to reconsider the case in light of the Supreme Court's ruling. In response to the legal issues, BAAQMD revised their CEQA Guidelines in May 2017. The thresholds identified in Table 1 represent the most recent guidance provided by BAAQMD and the community risk thresholds that are used by the City of Fremont. Though not necessarily a CEQA issue, the effect of existing TAC sources on future project receptors (residences) is analyzed to comply with the Clean Air Plan key goal of reducing population TAC exposure and protecting public health in the Bay Area.

For assessing community health risk impacts to new sensitive receptors, the City has developed a significance threshold of 100 incidents of cancer per million per General Plan implementation measure 7-7.3.B, taking into account the combined impact from existing sources of TACs.

Table 1. Air Quality Significance Thresholds

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Annual Average Emissions (tons/year)
Criteria Air Pollutants			
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 for New Sensitive Receptors - Combined Sources (Cumulative from all sources within 1,000 foot zone of influence) – City of Fremont Thresholds			
Excess Cancer Risk	>100 per one million		
Hazard Index	>10.0		
Annual Average $PM_{2.5}$	>0.8 µg/m^3		
Health Risks and Hazards for New Sources – Single and Combined Sources (Cumulative from all sources within 1,000 foot zone of influence) – BAAQMD Thresholds			
Excess Cancer Risk	>10.0 in one million (single source) and >100 per one million (cumulative)		
Hazard Index	>1.0 (single source) and >10.0 (cumulative)		
Annual Average $PM_{2.5}$	>0.3 µg/m^3 (single) and >0.8 µg/m^3 (cumulative)		
Greenhouse Gas Emissions			
GHG Annual Emissions	Compliance with a Qualified GHG Reduction Strategy OR 1,100 metric tons or 4.6 metric tons per capita		

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; and GHG = greenhouse gas.

Impacts and Mitigation Measures

Impact 1: Conflict with or obstruct implementation of the applicable air quality plan? ***No impact.***

The most recent clean air plan is the *2017 Clean Air Plan* that was adopted by BAAQMD in April 2017. The proposed project would not conflict with the latest Clean Air planning efforts since 1) the project would have emissions below the BAAQMD thresholds (see Impact 2), 2) the project would be considered urban infill, 3) the project would be located near employment centers, and 4) the project would be located near transit with regional connections.

Impact 2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable State or federal ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? ***Less-than-Significant with Construction-Period Mitigation.***

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

The California Emissions Estimator Model (CalEEMod) Version 2016.3.1 was used to predict emissions from construction and operation of the site assuming full build out of the project. The project land use types and size were input to CalEEMod.

Construction period emissions

CalEEMod provided annual emissions for construction. CalEEMod 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. A construction build-out scenario, including equipment list and schedule, was developed based on CalEEMod defaults for a project of this type and size. The proposed project land uses for each phase were input into CalEEMod, including 72 dwelling units entered as "Condo/Townhouse," 64 dwelling units entered as "Apartments Low Rise," 23,450 sf entered as "Regional Shopping Center," 1,550 sf entered as "Fast Food Restaurant w/o Drive Thru," 2,610 sf entered as "Day-Care Center," and 273 parking spaces entered as "Enclosed Parking with Elevator" on a 4.5-acre site. In addition, 20,100 cubic yards (cy) of soil off-haul is anticipated during the grading phase and demolition of 55,000 sf of buildings was entered into the model.

The project would be built out over a period of approximately 14 months beginning in March 2018 according to the CalEEMod default schedule, or an approximate 299 construction workdays. Average daily emissions were computed for each phase by dividing the total construction emissions by the number of construction days. Table 2 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 2, estimated the construction period emissions would not exceed the BAAQMD significance thresholds. *Attachment 2* includes the CalEEMod input and output worksheets.

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 1 would implement BAAQMD-recommended best management practices.*

Table 2. Construction Period Emissions by Phase

Scenario	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Total construction emissions (tons)	1.61 tons	4.47 tons	0.22 tons	0.20 tons
Average daily emissions (pounds)[1]	**10.8 lbs./day**	**29.9 lbs./day**	**1.5 lbs./day**	**1.3 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 299 workdays.				

Operational Period Emissions

Operational air emissions from the project would be generated primarily from autos driven by future residents, employees and customers. 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.

Land Uses

The project land uses were input to CalEEMod, as described above. In addition, an Existing run was conducted which included 43,468 sf entered as "Regional Shopping Center," 7,843 sf entered as "Quality Restaurant," 970 sf entered as "Unrefrigerated Warehouse-No Rail," and one dwelling unit entered as "Single Family Housing."

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 the project could possibly be constructed and begin operating would be 2020. Emissions associated with build-out later than 2020 would be lower.

Trip Generation Rates

CalEEMod allows the user to enter specific vehicle trip generation rates, which were input to the model using the daily trip generation rate provided in the project trip generation table, including the trip reductions for internalization, pass-by, and transit. The default trip lengths and trip types specified by CalEEMod were used.

Energy

CalEEMod defaults for energy use were used, which include the 2013 Title 24 Building Standards.

Other Inputs

Wood-burning stoves and fireplaces are not allowed in new developments in the Bay Area; however, it was assumed that residential units could contain gas-powered fireplaces. Default model assumptions for emissions associated with solid waste generation and water/wastewater use were applied to the project.

Table 3. Operational Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
2020 Project	1.39 tons	3.86 tons	1.50 tons	0.44 tons
Existing Uses	0.88 tons	3.80 tons	1.28 tons	0.37 tons
Net Emissions	**0.51 tons**	**0.06 tons**	**0.22 tons**	**0.07 tons**
BAAQMD Thresholds (tons /year)	*10 tons*	*10 tons*	*15 tons*	*10 tons*
Exceed Threshold?	**No**	**No**	**No**	**No**
Net Project Operational Emissions (*pounds/day*)	2.8 lbs	0.3 lbs	1.2 lbs	0.4 lbs
BAAQMD Thresholds (pounds/day)	*54* lbs.	*54* lbs.	*82* lbs.	*54* lbs.
Exceed Threshold?	**No**	**No**	**No**	**No**
[1] Assumes 365-day operation.				

As shown in Table 3, operational emissions would not exceed the BAAQMD significance thresholds. This would be considered a *less-than-significant* impact.

Mitigation Measure 1: **Include basic 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. 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.

Impact 3: Violate any air quality standard or contribute substantially to an existing or projected air quality violation? ***Less-than-Significant.***

As discussed under Impact 2, the project would have emissions less than the BAAQMD thresholds for evaluating regional impacts related to ozone and particulate matter. Therefore, the project would not contribute substantially to existing or projected violations of those standards. Carbon monoxide emissions from traffic generated by the project would be the pollutant of greatest concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Air pollutant monitoring data indicate that carbon monoxide levels have been at healthy levels (i.e., below State and federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. The highest measured level over any 8-hour averaging period during the last 3 years in the Bay Area is less than 3.0 parts per million (ppm), compared to the ambient air quality standard of 9.0 ppm. Intersections affected by the project would have traffic volumes less than the 10,000 vehicles per hour[5] and, thus, would not cause a violation of an ambient air quality standard or have a considerable contribution to cumulative violations of these standards.[6]

[5] The maximum hourly volume would be 3,683 vehicles per hour for "Cumulative with Project Traffic Volumes" – see Figure 13 of the TIA, dated December 1, 2017.

[6] For a land-use development project, the BAAQMD CEQA Air Quality Guidelines state that a proposed project would result in a less than significant impact to localized carbon monoxide concentrations if the project would not increase traffic at affected intersections with more than 44,000 vehicles per hour.

Impact 4: Expose sensitive receptors to substantial pollutant concentrations? ***Less-than-Significant with Construction-Period Mitigation.***

Project impacts related to increased community risk can occur either by introducing a new sensitive receptor, such as a residential use, in proximity to an existing source of TACs or by introducing a new source of TACs with the potential to adversely affect existing sensitive receptors in the project vicinity. The project would introduce new sensitive receptors (residences) in the proximity of nearby TAC sources, such as Peralta Boulevard (State Route 84), local roadways, and railroad traffic. Though not necessarily a CEQA issue, the effect of existing TAC sources on future project receptors (residences) is analyzed to comply with the Clean Air Plan goal of reducing population TAC exposure and protecting public health in the Bay Area. The BAAQMD recommends using a 1,000-foot screening radius around a project site for purposes of identifying community health risk from siting a new sensitive receptor or a new source of TACs.

The project would not be a substantial source of localized TACs. However, temporary project construction activity would generate dust and equipment exhaust on a temporary basis that could affect nearby sensitive receptors.

Operational Community Risk Impacts (Planning Consideration)

Community health risk assessments typically look at all substantial sources of TACs that can affect sensitive receptors that are located within 1,000 feet of a project site. These sources include freeways or highways, busy surface streets and stationary sources identified by BAAQMD. Traffic on high volume roadways is a source of TAC emissions that may adversely affect sensitive receptors in close proximity to the roadway. A review of the project area did not reveal any stationary sources within 1,000 feet with substantial risk. For local roadways, BAAQMD considers roadways with traffic volumes of over 10,000 vehicles per day to have a potentially significant impact on a proposed project. A review of the project area identified several sources of TAC emissions, such as SR-84/Peralta Boulevard, local surface streets, and nearby railroad traffic. Community risks from each source are discussed below.

<u>Peralta Boulevard (SR 84) and Local Roadways</u>

BAAQMD provides a Highway Screening Analysis Google Earth Map tool to identify estimated risk and hazard impacts from highways throughout the Bay Area. Cumulative risk, hazard and $PM_{2.5}$ impacts at various distances from the highway are estimated for different segments of the highways. The tool uses the average annual daily traffic (AADT) count, fleet mix and other modeling parameters specific to that segment of the highway. Impacts from Link 479 (6ft elevation) SR-84, which is 10 feet or greater north of the project site, were identified using this tool. The cancer risk at the project site was found to be 21.2 in a million. The $PM_{2.5}$ concentration was found to be 0.17 $\mu g/m^3$ and the HI is 0.02. The estimated cancer risk was adjusted using a

factor of 1.3744 to account for new OEHHA guidance. This factor was provided by BAAQMD for use with their CEQA screening tools.[7]
For local roadways, BAAQMD has provided the *Roadway Screening Analysis Calculator* to assess whether roadways with traffic volumes of over 10,000 vehicles per day may have a potentially significant effect on a proposed project. Two adjustments were made to the cancer risk predictions made by this calculator: (1) adjustment for latest vehicle emissions rates and (2) adjustment of cancer risk to reflect new OEHHA guidance (see *Attachment 1*).

The calculator uses EMFAC2011 emission rates for the year 2014. Overall, emission rates will decrease by the time the project is constructed and occupied. A new version of the emissions factor model, EMFAC2014 is available. This version predicts lower emission rates. An adjustment factor of 0.5 was developed by comparing emission rates of total organic gases (TOG) for running exhaust and running losses developed using EMFAC2011 for year 2014 and those from EMFAC2014 for year 2018.[8]

As described previously, the predicted cancer risk was then adjusted using a factor of 1.3744 to account for new OEHHA guidance. This factor was provided by BAAQMD for use with their CEQA screening tools that are used to predict cancer risk.

The average daily traffic (ADT) on Fremont Boulevard was estimated to be 21,309 based on the City traffic data.[9] Using the BAAQMD *Roadway Screening Analysis Calculator* for Alameda County for east-west directional roadways and at a distance of 10 feet or greater north of the roadway, estimated cancer risk from Fremont Boulevard at the project site would be would be 15.7 in one million and $PM_{2.5}$ concentration would be 0.46 $\mu g/m^3$. Chronic or acute HI for the roadway would be below 0.03.

Railroad Traffic

The project site is located near Centerville rail line, and rail activity currently generates TAC and $PM_{2.5}$ emissions from locomotive exhaust. These rail lines are used for passenger and freight service by trains using diesel fueled locomotives. The project site is about 300 feet or greater from the rail line. Dispersion modeling of this rail segment was conducted as part of the Fremont General Plan Update[10] and computed cancer risks at various distances were estimated. According to the assessment, excess cancer risk along this segment at 300 feet would be 11.5 in one million. Annual $PM_{2.5}$ concentration would be 0.02 $\mu g/m^3$.

Combined Community Risk Levels

Adding the maximum TAC impacts together, although they would occur at different locations, the combined cancer risk would be 48.4 per million, combined $PM_{2.5}$ concentration would be 0.65 and

[7] Correspondence with Alison Kirk, BAAQMD, November 23, 2015.
[8] Though the project will likely be operational after 2018, this analysis year was used for the *Roadway Screening Analysis Calculator* as a conservative measure for estimating community risk.
[9] Available online: https://fremont.gov/DocumentCenter/Home/View/5722. Accessed: October 13, 2017.
[10] City of Fremont, 2011. *Fremont Draft General Plan Update*. July.

the non-cancer hazard index would be less than 0.05. Therefore, community risk impacts would be below the City of Fremont community risk thresholds.

Table 4. Combined Community TAC Levels

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Acute or Chronic Hazard Index
Peralta Boulevard (SR-84)	21.2	0.17	0.02
Fremont Boulevard	15.7	0.46	<0.03
Centerville Rail Line	11.5	0.02	
Combined Sources	48.4	0.65	<0.05
Fremont Combined Source Threshold	*100.0*	*0.8*	*10.0*

Note: The maximum for each source unlikely to occur in same place on the project site, but this combined level assumes that scenario as a worst-case assessment.

Project Construction Activity

Construction activities, particularly during site preparation and grading would temporarily generate fugitive dust in the form of respirable particulate matter (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 employed to reduce these emissions. *Mitigation Measure 1 would implement BAAQMD-required best management practices.*

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issues associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. 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 of sensitive receptors at these nearby residences from construction emissions of DPM and $PM_{2.5}$.[11] The closest sensitive receptors to the project site are residences north of the project site on Jason Way, with additional nearby residences to the east, north, and south of the project site. There are also several preschools and a school in the project vicinity. These include the Holy Spirit preschool and school located across from the site to the east on Parish Avenue, A Childs Hideaway preschool southeast from the site on Fremont Boulevard, and the Genius Kids preschool northeast of the project site on Peralta Boulevard (see Figure 1). Children at these locations are three years of age and older. Emissions and dispersion modeling was conducted to predict the off-site concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated.

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

Construction Period Emissions

Construction activity is anticipated to include demolition, grading and site preparation, building construction, and paving. Construction period emissions of DPM and $PM_{2.5}$ were modeled using the CalEEMod model, as previously described for project air pollutant emissions. Construction of the project is expected to occur over an approximate 14-month period beginning in 2018. Construction period emissions were modeled using CalEEMod along with the anticipated project construction activity. The number and types of construction equipment and diesel vehicles, along with the anticipated length of their use for different phases of construction, were based on a site-specific construction schedule. The CalEEMod modeling included emissions from truck and worker travel, assumed to occur over a distance of one-half mile on or near the site.

The CalEEMod model provided total uncontrolled 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 of 0.208 tons (416 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-half mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod as 0.045 tons (90 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA ISCST3 dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at existing sensitive receptors in the vicinity of the project construction area. The ISCST3 dispersion model is a BAAQMD-recommended model for use in modeling these types of emission activities for CEQA projects.[12] Emission sources for the construction site were grouped into two categories, exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions. The ISCST3 modeling utilized four area sources to represent the on-site construction emissions, two area sources for DPM exhaust emissions and two area sources for fugitive $PM_{2.5}$ dust emissions. For the exhaust emissions from construction equipment, an emission release height of 6 meters (20 feet) was used for the area sources. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases. For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of 2 meters (6.6 feet) was used for the area sources. Emissions from vehicle travel around the project site were included in the modeled area sources. Construction emissions were modeled as occurring daily between 7 a.m. and 4 p.m., when the majority of the construction activity involving equipment usage would occur.

The modeling used a five-year data set (1990 - 1994) of hourly meteorological data for Fremont that was prepared by the BAAQMD for use with the ISCST3 model. The Fremont monitoring

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

station is about 1.2 miles southeast of the project site. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2018 - 2019 period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby residential receptors at a receptor height of 1.5 meters (4.9 feet). Receptor heights of 1.0 meters were used for modeling of preschool and school child receptors.

The maximum-modeled DPM and $PM_{2.5}$ concentrations at a residence occurred north of the construction site at residence on Jason Way and the maximum DPM and $PM_{2.5}$ concentrations at a preschool or school occurred at the Holy Spirit preschool across from the project site on Parish Avenue. The locations where the maximum $PM_{2.5}$ and DPM concentrations occurred (and maximum cancer risks) are identified on Figure 1.

Predicted Cancer Risks and Hazards

Increased cancer risks were calculated using the maximum modeled concentrations for the 2018 - 2019 period and BAAQMD recommended risk assessment methods for an infant exposure (3rd trimester through two years of age) and for an adult exposure at residences and child exposures (three years to 16 years of age) at the preschools and school. The cancer risk calculations were based on applying the BAAQMD recommended age sensitivity factors to the TAC concentrations, as described 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 through the entire construction period and child exposures were assumed to occur at the preschools and school through the entire construction period. Table 5 shows the construction risk levels from the project and the combination with existing nearby TAC sources.

Results of this assessment indicate that the maximum increased residential cancer risks would be 109.8 in one million for an infant exposure and 1.9 in one million for an adult exposure. For a preschool child exposure the maximum increased cancer risk would be 16.8 in one million. The location of the receptor with the maximum cancer risk, or maximally exposed individual (MEI), is shown in Figure 1.

The maximum-modeled annual $PM_{2.5}$ concentration, which is based on combined exhaust and fugitive dust emissions, was 0.8 $\mu g/m^3$, occurring at the residential site with the maximum cancer risk. This would exceed the single-source threshold and be considered *significant*.

The maximum modeled annual DPM concentration (i.e., from construction exhaust) was 0.6687 $\mu g/m^3$. The maximum computed hazard index (HI) based on this DPM concentration is 0.13.

Table 5. Cumulative Community TAC Levels at Construction MEI

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Acute or Chronic Hazard Index
Project Construction	**109.8 (infant)**	**0.8**	0.13
Peralta Boulevard (SR-84)	4.6	0.04	<0.01
Fremont Boulevard	2.8	0.08	<0.03
Centerville Rail Line	<7.8	<0.01	<0.01
Cumulative Sources Total	**<125**	<0.93	<0.18
Single Source Threshold	*>10.0*	*>0.3*	*>1.0*
Exceed Single Source Threshold	*Yes*	*Yes*	*No*
Cumulative Source Threshold	*>100.0*	*>0.8*	*>10.0*
Exceed Combined Source Threshold	*Yes*	*Yes*	*No*

As shown in Table 5, the project would have a *significant* impact with respect to community risk caused by project construction activities, since cancer risk and annual $PM_{2.5}$ concentration and above the single- and cumulative-source thresholds for cancer risk and annual $PM_{2.5}$ concentrations. *Attachment 2* includes the emission calculations and source information used in the modeling and the cancer risk calculations. *Implementation of Mitigation Measure 1 and 2 would reduce this impact to a level of less than significant.*

Mitigation Measure 2: **Selection of equipment during construction to minimize emissions. Such equipment selection would include the following:**

> All diesel-powered off-road equipment operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA particulate matter emissions standards for Tier 4 engines or equivalent. Note that the construction contractor could use other measures to minimize construction period DPM emission to reduce the predicted cancer risk below the thresholds. The use of equipment that includes CARB-certified Level 3 Diesel Particulate Filters[13] or alternatively-fueled equipment (i.e., non-diesel) would meet this requirement. Other measures may be the use of added exhaust devices, or a combination of measures, provided that these measures are approved by the City and demonstrated to reduce community risk impacts to less than significant.

Effectiveness of Mitigation

Implementation of *Mitigation Measure 1* is considered to reduce exhaust emissions by 5 percent and fugitive dust emissions by over 50 percent. Implementation of *Mitigation Measure 2* would further reduce on-site diesel exhaust emissions by over 90 percent. Table 6 reports the maxim construction community risks and combined community risk levels with mitigation measures

[13] See http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm

implemented. With mitigation, the maximum construction risk would be reduced to 6.3 per million for a residential infant and 1.0 for a pre-school child. Maximum PM2.5 annual concentrations would be reduced to less than 0.1 $\mu g/m^3$. The combined increased lifetime residential cancer risk from construction, assuming infant exposure, would be less than 21.5 in one million. With mitigation, the combined annual $PM_{2.5}$ concentrations with construction would be less than 0.21$\mu g/m^3$ for a residential exposure. *After implementation of these recommended measures, the project would have a less-than-significant impact with respect to community risk caused by construction activities.*

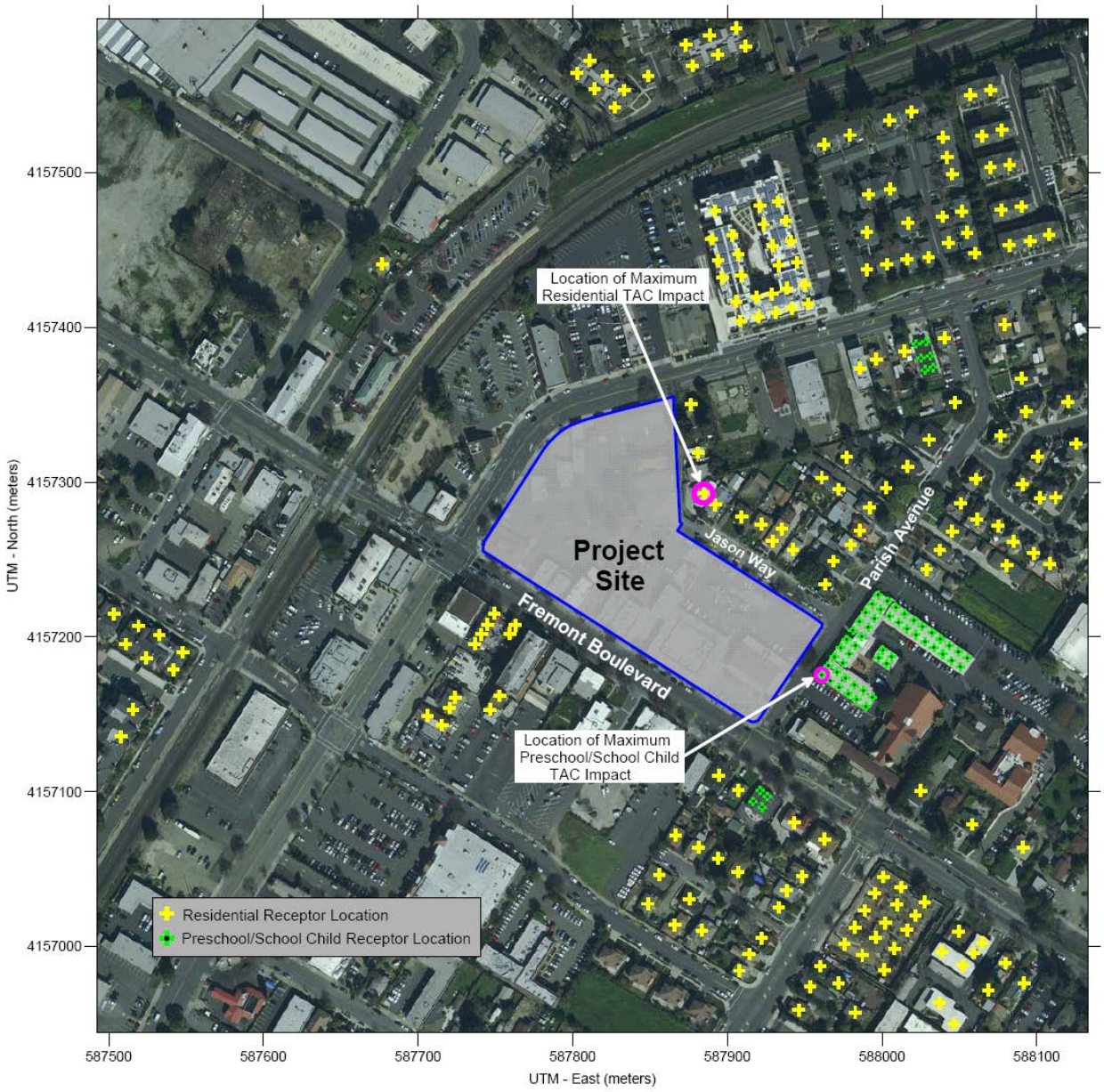
Table 6. Mitigated Combined Community TAC Levels at Construction MEI

Source	Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Acute or Chronic Hazard Index
Mitigated Project Construction	6.3	0.08	0.01
Peralta Boulevard (SR-84)	4.6	0.04	<0.01
Fremont Boulevard	2.8	0.08	<0.03
Centerville Rail Line	<7.8	<0.01	<0.01
Cumulative Sources Total	<21.5	<0.21	<0.06
Single Source Threshold	*>10.0*	*>0.3*	*>1.0*
Exceed Single Source Threshold	*No*	*No*	*No*
Cumulative Source Threshold	*>100.0*	*>0.8*	*>10.0*
Exceed Combined Source Threshold	*No*	*No*	*No*

Impact 5: Create objectionable odors affecting a substantial number of people? ***Less than significant.***

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. This would be a *less-than-significant impact.*

Figure 1. Project Construction Site and Locations of Off-Site Sensitive Receptors and Maximum TAC and $PM_{2.5}$ Impacts



Greenhouse Gas Emissions

Impact 6: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? ***Less than significant.***

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 estimate 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, including an Existing run to compute project net emissions. Unless otherwise noted below, the CalEEMod model defaults for Alameda County were used. CalEEMod provides emissions for transportation, areas sources, electricity consumption, natural gas combustion, electricity usage associated with water usage and wastewater discharge, and solid waste land filling and transport. CalEEMod output worksheets are included in *Attachment 2*.

Trip Generation Rates

CalEEMod allows the user to enter specific trip generation rates. The daily trip data was obtained from the project traffic report, as described above.

Model Year

The model uses mobile emission factors from CARB's EMFAC2014 model. This model is sensitive to the year selected, since vehicle emissions have and continue to be reduced due to fuel efficiency standards and low carbon fuels. The year 2020 was analyzed since it is the first year that the built-out project could conceivably be occupied.

Energy

CalEEMod 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. The rate was adjusted to account for PG&E's projected 2020 CO_2 intensity rate. This 2020 rate is based, in part, on the requirement of a renewable energy portfolio standard of 33 percent by the year 2020. The derived 2020 rate for PG&E was estimated at 290 pounds of CO_2 per megawatt of electricity delivered.[14] The model includes the 2013 Title 24 Building Standards. Default rates for energy consumption were assumed in the model.

[14] Pacific Gas & Electric, 2015. *Greenhouse Gas Emission Factors: Guidance for PG&E Customers.* November.

Other Inputs

Default model assumptions for emissions associated with solid waste generation and water/wastewater use were applied to the project. No new wood-burning fireplaces are allowed in the Bay Area, but it was assumed that new residences could include gas-powered fireplaces.

Construction Emissions

GHG emissions associated with construction were computed to be 750 metric tons (MT) of CO_2e for the total construction period and 584 MT for the maximum year. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the City nor BAAQMD have an adopted threshold of significance for construction-related GHG emissions, though BAAQMD recommends quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable. Best management practices assumed to be incorporated into construction of the proposed project include, but are not limited to: using local building materials of at least 10 percent and recycling or reusing at least 50 percent of construction waste or demolition materials.

Operational Emissions

The CalEEMod model, along with the project vehicle trip generation rates, was used to estimate annual net missions associated with operation of the fully-developed site under the proposed project. In 2020, as shown in Table 7, annual net emissions resulting from operation of the proposed project are estimated to be 3.0 MT of CO_2e/year/service population, which would be below the BAAQMD significance threshold of 1,100 MT of CO_2e/ year. Therefore, this would be considered a less than significant impact.

Table 7. Annual GHG emissions of CO_2e (MT/year)

Source Category	Existing Uses	2020 Proposed Project
Area	<1	7
Energy Consumption	178	455
Mobile	1,655	1,843
Waste	28	55
Water Usage	13	26
Total	1,874	2,386
Net Emissions		512
BAAQMD Threshold		**1,100 MT of CO_2e**
Significant?		***No***

Impact 7: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs? ***Less than significant.***

Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, codifies the State of California'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, CARB, California Energy Commission (CEC), the California Public Utilities Commission (CPUC), and the 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 of California's main strategies to reduce GHGs from business-as-usual (BAU) emissions projected in 2020 back down to 1990 levels. 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. It required CARB and other state agencies to develop and adopt regulations and other initiatives reducing GHGs by 2012.

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.

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 proposed project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB's Scoping Plan. For example, proposed buildings would be constructed in conformance with CALGreen and the Title 24 Building Code, which requires high-efficiency water fixtures and water-efficient irrigation systems.

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.[15] 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.[16] This HRA used the recent 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.[17] 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 are 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 of exposure, and the exposure duration. 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). As recommended by the BAAQMD, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions (e.g., roadways).

---

[15] 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.

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

[17] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. January 2016.

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 that would 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)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

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

Parameter	*Exposure Type* →	Infant		Child		Adult
	Age Range →	3rd Trimester	0<2	2 < 9	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	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	631	572	261
Inhalation Absorption Factor		1	1	1	1	1
Averaging Time (years)		70	70	70	70	70
Exposure Duration (years)		0.25	2	14	14	14
Exposure Frequency (days/year)		350	350	350	350	350
Age Sensitivity Factor		10	10	3	3	1
Fraction of Time at Home		0.85-1.0	0.85-1.0	0.72-1.0	0.72-1.0	0.73

* 95th percentile breathing rates for 3rd trimester and infants and 80th percentile for children and adults

Non-Cancer Hazards

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 Input and Output Worksheets, and Risk Calculations

Fremont Blvd Mixed Use Project - Fremont, CA

DPM Emissions and Modeling Emission Rates

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 ($g/s/m^2$)
2018-2019	Construction	0.2082	CON_DPM	416.4	0.12676	1.60E-02	20,679	7.72E-07
Total		***0.2082***		***416.4***	***0.1268***	***0.0160***		

Operation Hours

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

PM2.5 Fugitive Dust Emissions for Modeling

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 $g/s/m^2$
2018-2019	Construction	CON_FUG	0.0450	90.0	0.02740	3.45E-03	20,679	1.67E-07
Total			***0.0450***	***90.0***	***0.0274***	***0.0035***		

Operation Hours

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

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2018-2019	Construction	0.0120	CON_DPM	24.0	0.00731	9.21E-04	20,679	4.45E-08
Total		***0.0120***		***24***	***0.0073***	***0.0009***		

Construction Hours

hr/day =	10	(7am - 4pm)
days/yr =	365	
hours/year =	3285	

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

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2018-2019	Construction	CON_FUG	0.0122	24.4	0.00743	9.37E-04	20,679	4.53E-08
Total			***0.0122***	***24.4***	***0.0074***	***0.0009***		

Construction Hours

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

Fremont Blvd Mixed Use Project - Fremont, CA - Health Impact Summary

Maximum Impacts at Residential MEI Location - Unmitigated

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2018-2019	0.6687	0.1492	**109.8**	**1.9**	**0.13**	**0.82**

Maximum Impacts at Preschool/School Child MEI Location - Unmitigated

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2018-2019	0.5872	0.1314	**16.8**	**1.7**	**0.12**	**0.72**

Maximum Impacts at MEI Location - with Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2018-2019	0.0385	0.0400	**6.3**	**0.1**	**0.01**	**0.08**

Maximum Impacts at Preschool/School Child MEI Location -with Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Child	Cancer Risk (per million): Adult	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2018-2019	0.0339	0.0356	**1.0**	**0.1**	**0.01**	**0.07**

Fremont Blvd Mixed Use Project - Fremont, CA - Unmitigated Construction Impacts
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 - 9**	**2 - 16**	**16 - 30**
Parameter					
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult		
			DPM Conc (ug/m3)		Age	Cancer	Modeled DPM Conc (ug/m3)		Age	Cancer		
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-		
1	1	0 - 1	2018	0.6687	10	109.82	2018	0.6687	1	1.92	0.1492	0.818
2	1	1 - 2	2019	0.0000	10	0.00	2019	0.0000	1	0.00		
3	1	2 - 3	2020	0.0000	3	0.00	2020	0.0000	1	0.00		
4	1	3 - 4	2021	0.0000	3	0.00	2021	0.0000	1	0.00		
5	1	4 - 5	2022	0.0000	3	0.00	2022	0.0000	1	0.00		
6	1	5 - 6	2023	0.0000	3	0.00	2023	0.0000	1	0.00		
7	1	6 - 7	2024	0.0000	3	0.00	2024	0.0000	1	0.00		
8	1	7 - 8	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
9	1	8 - 9	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
10	1	9 - 10	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
11	1	10 - 11	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
12	1	11 - 12	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
13	1	12 - 13	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
14	1	13 - 14	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
15	1	14 - 15	2032	0.0000	3	0.00	2032	0.0000	1	0.00		
16	1	15 - 16	2033	0.0000	3	0.00	2033	0.0000	1	0.00		
17	1	16-17	2034	0.0000	1	0.00	2034	0.0000	1	0.00		
18	1	17-18	2035	0.0000	1	0.00	2035	0.0000	1	0.00		
19	1	18-19	2036	0.0000	1	0.00	2036	0.0000	1	0.00		
20	1	19-20	2037	0.0000	1	0.00	2037	0.0000	1	0.00		
21	1	20-21	2038	0.0000	1	0.00	2038	0.0000	1	0.00		
22	1	21-22	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
23	1	22-23	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
24	1	23-24	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
25	1	24-25	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
26	1	25-26	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
27	1	26-27	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
28	1	27-28	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
29	1	28-29	2046	0.0000	1	0.00	2046	0.0000	1	0.00		
30	1	29-30	2047	0.0000	1	0.00	2047	0.0000	1	0.00		
Total Increased Cancer Risk						**109.8**				**1.92**		

* Third trimester of pregnancy

Fremont Blvd Mixed Use Project - Fremont, CA - Construction Impacts with Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

	Infant/Child				Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 9**	**2 - 16**	**16 - 30**
Parameter					
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	1.00	1.00	1.00	0.73

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult		
			DPM Conc (ug/m3)		Age	Cancer	Modeled DPM Conc (ug/m3)		Age	Cancer		
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Year**	**Annual**	**Sensitivity Factor**	**Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-		
1	1	0 - 1	2018	0.0385	10	6.33	2018	0.0385	1	0.11	0.0400	0.079
2	1	1 - 2	2019	0.0000	10	0.00	2019	0.0000	1	0.00		
3	1	2 - 3	2020	0.0000	3	0.00	2020	0.0000	1	0.00		
4	1	3 - 4	2021	0.0000	3	0.00	2021	0.0000	1	0.00		
5	1	4 - 5	2022	0.0000	3	0.00	2022	0.0000	1	0.00		
6	1	5 - 6	2023	0.0000	3	0.00	2023	0.0000	1	0.00		
7	1	6 - 7	2024	0.0000	3	0.00	2024	0.0000	1	0.00		
8	1	7 - 8	2025	0.0000	3	0.00	2025	0.0000	1	0.00		
9	1	8 - 9	2026	0.0000	3	0.00	2026	0.0000	1	0.00		
10	1	9 - 10	2027	0.0000	3	0.00	2027	0.0000	1	0.00		
11	1	10 - 11	2028	0.0000	3	0.00	2028	0.0000	1	0.00		
12	1	11 - 12	2029	0.0000	3	0.00	2029	0.0000	1	0.00		
13	1	12 - 13	2030	0.0000	3	0.00	2030	0.0000	1	0.00		
14	1	13 - 14	2031	0.0000	3	0.00	2031	0.0000	1	0.00		
15	1	14 - 15	2032	0.0000	3	0.00	2032	0.0000	1	0.00		
16	1	15 - 16	2033	0.0000	3	0.00	2033	0.0000	1	0.00		
17	1	16-17	2034	0.0000	1	0.00	2034	0.0000	1	0.00		
18	1	17-18	2035	0.0000	1	0.00	2035	0.0000	1	0.00		
19	1	18-19	2036	0.0000	1	0.00	2036	0.0000	1	0.00		
20	1	19-20	2037	0.0000	1	0.00	2037	0.0000	1	0.00		
21	1	20-21	2038	0.0000	1	0.00	2038	0.0000	1	0.00		
22	1	21-22	2039	0.0000	1	0.00	2039	0.0000	1	0.00		
23	1	22-23	2040	0.0000	1	0.00	2040	0.0000	1	0.00		
24	1	23-24	2041	0.0000	1	0.00	2041	0.0000	1	0.00		
25	1	24-25	2042	0.0000	1	0.00	2042	0.0000	1	0.00		
26	1	25-26	2043	0.0000	1	0.00	2043	0.0000	1	0.00		
27	1	26-27	2044	0.0000	1	0.00	2044	0.0000	1	0.00		
28	1	27-28	2045	0.0000	1	0.00	2045	0.0000	1	0.00		
29	1	28-29	2046	0.0000	1	0.00	2046	0.0000	1	0.00		
30	1	29-30	2047	0.0000	1	0.00	2047	0.0000	1	0.00		
Total Increased Cancer Risk						**6.3**				**0.11**		

* Third trimester of pregnancy

Fremont Blvd Mixed Use Project - Fremont, CA - Construction Impacts
Maximum DPM Cancer Risk Calculations From Construction
Daycare/School Child Receptor Locations

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 - 9**	**2 - 16**	**16 - 30**
Parameter					
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	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					
				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)**	**Fugitive PM2.5**	**Total PM2.5**
2018	1	5 - 6	2018	0.5872	3	16.75	2018	0.5872	1	1.69	0.1314	0.719
Total Increased Cancer Risk						**16.75**				**1.69**		

Fremont Blvd Mixed Use Project - Fremont, CA - Construction Impacts with Mitigation
Maximum DPM Cancer Risk Calculations From Construction
Daycare/School Child Receptor Locations

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 - 9**	**2 - 16**	**16 - 30**
Parameter					
ASF =	10	10	3	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	631	572	261
A =	1	1	1	1	1
EF =	350	350	350	350	350
AT =	70	70	70	70	70
FAH =	1.00	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					
				DPM Conc (ug/m3)				Modeled DPM Conc (ug/m3)				
Exposure Year	**Exposure Duration (years)**	**Age**	**Year**	**Annual**	**Age Sensitivity Factor**	**Infant/Child Cancer Risk (per million)**	**Year**	**Annual**	**Age Sensitivity Factor**	**Adult Cancer Risk (per million)**	**Fugitive PM2.5**	**Total PM2.5**
2018	1	5 - 6	2018	0.0339	3	0.97	2018	0.0339	1	0.10	0.0356	0.069
Total Increased Cancer Risk						**0.97**				**0.10**		

Silicon Sage - Centerville, Construction and Operations - Alameda County, Annual

Silicon Sage - Centerville, Construction and Operations

Alameda County, Annual

Criteria Air Pollutant and GHG Oputput

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	2.61	1000sqft	0.00	2,610.00	0
Enclosed Parking with Elevator	273.00	Space	0.00	109,200.00	0
Fast Food Restaurant w/o Drive Thru	1.55	1000sqft	0.00	1,550.00	0
Apartments Low Rise	64.00	Dwelling Unit	0.00	64,000.00	183
Condo/Townhouse	72.00	Dwelling Unit	4.50	72,000.00	206
Regional Shopping Center	23.45	1000sqft	0.00	23,450.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 carbon rate

Land Use - Land uses and site acreage from traffic report and plan drawings

Construction Phase - default, assume March 2018 start

Trips and VMT -

Demolition - Up to 55,000 sf of bldg demo

Grading - 20,100cy soil export

Vehicle Trips - Trip rates from project traffic report. Pass-by set to zero for retail since already included in trip reductions.

Woodstoves - No woodstoves, possible gas-powered fireplaces

Energy Use - default

Construction Off-road Equipment Mitigation - Tier 4 engines for equip > 25hp. BAAQMD BMPs.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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
tblEnergyUse	LightingElect	2.51	2.58
tblEnergyUse	LightingElect	1.75	2.63
tblEnergyUse	LightingElect	5.34	5.48
tblEnergyUse	LightingElect	4.88	5.00
tblEnergyUse	NT24E	3,172.76	3,418.36
tblEnergyUse	NT24E	3,795.01	4,109.59
tblEnergyUse	T24E	233.06	274.84
tblEnergyUse	T24E	204.52	231.62
tblEnergyUse	T24E	0.66	0.69
tblEnergyUse	T24E	2.67	2.80
tblEnergyUse	T24E	2.24	2.35
tblEnergyUse	T24NG	17,734.50	25,590.91
tblEnergyUse	T24NG	20,104.20	25,448.35
tblEnergyUse	T24NG	14.85	14.93
tblEnergyUse	T24NG	39.90	40.10
tblEnergyUse	T24NG	3.90	3.92
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	9.60	20.48
tblFireplaces	NumberGas	10.80	23.04
tblFireplaces	NumberWood	10.88	0.00
tblFireplaces	NumberWood	12.24	0.00
tblGrading	MaterialExported	0.00	20,100.00
tblLandUse	LotAcreage	0.06	0.00
tblLandUse	LotAcreage	2.46	0.00
tblLandUse	LotAcreage	0.04	0.00

tblLandUse	LotAcreage	4.00	0.00
tblLandUse	LotAcreage	0.54	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblVehicleTrips	PB_TP	12.00	0.00
tblVehicleTrips	PB_TP	11.00	0.00
tblVehicleTrips	PR_TP	51.00	63.00
tblVehicleTrips	PR_TP	54.00	65.00
tblVehicleTrips	ST_TR	7.16	5.58
tblVehicleTrips	ST_TR	5.67	4.37
tblVehicleTrips	ST_TR	696.00	361.92
tblVehicleTrips	ST_TR	49.97	29.48
tblVehicleTrips	SU_TR	6.07	4.73
tblVehicleTrips	SU_TR	4.84	3.73
tblVehicleTrips	SU_TR	500.00	260.00
tblVehicleTrips	SU_TR	25.24	14.89
tblVehicleTrips	WD_TR	6.59	5.17
tblVehicleTrips	WD_TR	5.81	4.49
tblVehicleTrips	WD_TR	716.00	372.90
tblVehicleTrips	WD_TR	42.70	25.25
tblWoodstoves	NumberCatalytic	1.28	0.00
tblWoodstoves	NumberCatalytic	1.44	0.00
tblWoodstoves	NumberNoncatalytic	1.28	0.00
tblWoodstoves	NumberNoncatalytic	1.44	0.00
tblWoodstoves	WoodstoveDayYear	14.12	0.00
tblWoodstoves	WoodstoveDayYear	14.12	0.00
tblWoodstoves	WoodstoveWoodMass	582.40	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					
2018	0.3981	3.7503	2.6249	6.3700e-003	0.2594	0.1766	0.4360	0.0858	0.1657	0.2515	0.0000	581.9978	581.9978	0.0846	0.0000	584.1124
2019	1.2096	0.7234	0.6509	1.3500e-003	0.0363	0.0376	0.0739	9.7900e-003	0.0353	0.0451	0.0000	120.7194	120.7194	0.0199	0.0000	121.2165
Maximum	**1.2096**	**3.7503**	**2.6249**	**6.3700e-003**	**0.2594**	**0.1766**	**0.4360**	**0.0858**	**0.1657**	**0.2515**	**0.0000**	**581.9978**	**581.9978**	**0.0846**	**0.0000**	**584.1124**

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					
2018	0.1496	2.1769	2.6866	6.3700e-003	0.1822	0.0146	0.1968	0.0528	0.0143	0.0672	0.0000	581.9975	581.9975	0.0846	0.0000	584.1121
2019	1.1585	0.4484	0.6819	1.3500e-003	0.0363	3.3000e-003	0.0396	9.7900e-003	3.2500e-003	0.0130	0.0000	120.7193	120.7193	0.0199	0.0000	121.2165
Maximum	**1.1585**	**2.1769**	**2.6866**	**6.3700e-003**	**0.1822**	**0.0146**	**0.1968**	**0.0528**	**0.0143**	**0.0672**	**0.0000**	**581.9975**	**581.9975**	**0.0846**	**0.0000**	**584.1121**

	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	**18.63**	**41.31**	**-2.83**	**0.00**	**26.10**	**91.63**	**53.63**	**34.51**	**91.25**	**72.95**	**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	**3-1-2018**	**5-31-2018**	1.7026	0.9920
2	**6-1-2018**	**8-31-2018**	1.0610	0.5805
3	**9-1-2018**	**11-30-2018**	1.0541	0.5788

4	**12-1-2018**	**2-28-2019**	0.9807	0.5660
5	**3-1-2019**	**5-31-2019**	1.3448	1.2735
		Highest	1.7026	1.2735

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	0.7901	0.0164	1.0180	8.0000e-005		5.9600e-003	5.9600e-003		5.9600e-003	5.9600e-003	0.0000	7.0879	7.0879	1.7300e-003	1.0000e-004	7.1608
Energy	0.0229	0.1965	0.0920	1.2500e-003		0.0158	0.0158		0.0158	0.0158	0.0000	452.0343	452.0343	0.0269	8.8200e-003	455.3357
Mobile	0.5774	3.6424	6.0677	0.0200	1.4565	0.0242	1.4807	0.3916	0.0229	0.4144	0.0000	1,840.9353	1,840.9353	0.0881	0.0000	1,843.1376
Waste						0.0000	0.0000		0.0000	0.0000	22.0083	0.0000	22.0083	1.3007	0.0000	54.5246
Water						0.0000	0.0000		0.0000	0.0000	3.5470	11.1663	14.7133	0.3654	8.8300e-003	26.4813
Total	**1.3903**	**3.8553**	**7.1776**	**0.0213**	**1.4565**	**0.0460**	**1.5025**	**0.3916**	**0.0446**	**0.4362**	**25.5553**	**2,311.2238**	**2,336.7791**	**1.7828**	**0.0178**	**2,386.6399**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7901	0.0164	1.0180	8.0000e-005		5.9600e-003	5.9600e-003		5.9600e-003	5.9600e-003	0.0000	7.0879	7.0879	1.7300e-003	1.0000e-004	7.1608
Energy	0.0229	0.1965	0.0920	1.2500e-003		0.0158	0.0158		0.0158	0.0158	0.0000	452.0343	452.0343	0.0269	8.8200e-003	455.3357
Mobile	0.5774	3.6424	6.0677	0.0200	1.4565	0.0242	1.4807	0.3916	0.0229	0.4144	0.0000	1,840.9353	1,840.9353	0.0881	0.0000	1,843.1376

Waste						0.0000	0.0000		0.0000	0.0000	22.0083	0.0000	22.0083	1.3007	0.0000	54.5246
Water						0.0000	0.0000		0.0000	0.0000	3.5470	11.1663	14.7133	0.3654	8.8300e-003	26.4813
Total	**1.3903**	**3.8553**	**7.1776**	**0.0213**	**1.4565**	**0.0460**	**1.5025**	**0.3916**	**0.0446**	**0.4362**	**25.5553**	**2,311.2238**	**2,336.7791**	**1.7828**	**0.0178**	**2,386.6399**

	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	3/1/2018	3/28/2018	5	20	
2	Site Preparation	Site Preparation	3/29/2018	4/4/2018	5	5	
3	Grading	Grading	4/5/2018	4/16/2018	5	8	
4	Building Construction	Building Construction	4/17/2018	3/4/2019	5	230	
5	Paving	Paving	3/5/2019	3/28/2019	5	18	
6	Architectural Coating	Architectural Coating	3/29/2019	4/23/2019	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 275,400; Residential Outdoor: 91,800; Non-Residential Indoor: 41,415; Non-Residential Outdoor: 13,805; 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
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
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	2,513.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	153.00	37.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	31.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	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 - 2018

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					0.0271	0.0000	0.0271	4.1000e-003	0.0000	4.1000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0372	0.3832	0.2230	3.9000e-004		0.0194	0.0194		0.0181	0.0181	0.0000	35.1241	35.1241	9.6800e-003	0.0000	35.3660
Total	**0.0372**	**0.3832**	**0.2230**	**3.9000e-004**	**0.0271**	**0.0194**	**0.0465**	**4.1000e-003**	**0.0181**	**0.0222**	**0.0000**	**35.1241**	**35.1241**	**9.6800e-003**	**0.0000**	**35.3660**

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	1.1900e-003	0.0409	6.7700e-003	1.0000e-004	2.1200e-003	1.5000e-004	2.2700e-003	5.8000e-004	1.5000e-004	7.3000e-004	0.0000	9.7694	9.7694	5.1000e-004	0.0000	9.7822
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	6.3000e-004	4.9000e-004	4.9300e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.1207	1.1207	4.0000e-005	0.0000	1.1216
Total	**1.8200e-003**	**0.0413**	**0.0117**	**1.1000e-004**	**3.3100e-003**	**1.6000e-004**	**3.4600e-003**	**9.0000e-004**	**1.6000e-004**	**1.0500e-003**	**0.0000**	**10.8901**	**10.8901**	**5.5000e-004**	**0.0000**	**10.9038**

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					6.0900e-003	0.0000	6.0900e-003	9.2000e-004	0.0000	9.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.8400e-003	0.1356	0.2467	3.9000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	35.1240	35.1240	9.6800e-003	0.0000	35.3660
Total	**5.8400e-003**	**0.1356**	**0.2467**	**3.9000e-004**	**6.0900e-003**	**6.2000e-004**	**6.7100e-003**	**9.2000e-004**	**6.2000e-004**	**1.5400e-003**	**0.0000**	**35.1240**	**35.1240**	**9.6800e-003**	**0.0000**	**35.3660**

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	1.1900e-003	0.0409	6.7700e-003	1.0000e-004	2.1200e-003	1.5000e-004	2.2700e-003	5.8000e-004	1.5000e-004	7.3000e-004	0.0000	9.7694	9.7694	5.1000e-004	0.0000	9.7822
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	6.3000e-004	4.9000e-004	4.9300e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.1207	1.1207	4.0000e-005	0.0000	1.1216
Total	**1.8200e-003**	**0.0413**	**0.0117**	**1.1000e-004**	**3.3100e-003**	**1.6000e-004**	**3.4600e-003**	**9.0000e-004**	**1.6000e-004**	**1.0500e-003**	**0.0000**	**10.8901**	**10.8901**	**5.5000e-004**	**0.0000**	**10.9038**

3.3 Site Preparation - 2018

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					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.1205	0.0562	1.0000e-004		6.4400e-003	6.4400e-003		5.9300e-003	5.9300e-003	0.0000	8.6900	8.6900	2.7100e-003	0.0000	8.7576
Total	**0.0114**	**0.1205**	**0.0562**	**1.0000e-004**	**0.0452**	**6.4400e-003**	**0.0516**	**0.0248**	**5.9300e-003**	**0.0308**	**0.0000**	**8.6900**	**8.6900**	**2.7100e-003**	**0.0000**	**8.7576**

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	1.9000e-004	1.5000e-004	1.4800e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3362	0.3362	1.0000e-005	0.0000	0.3365
Total	**1.9000e-004**	**1.5000e-004**	**1.4800e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3362**	**0.3362**	**1.0000e-005**	**0.0000**	**0.3365**

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					0.0102	0.0000	0.0102	5.5900e-003	0.0000	5.5900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7400e-003	0.0304	0.0574	1.0000e-004		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	8.6900	8.6900	2.7100e-003	0.0000	8.7576
Total	**1.7400e-003**	**0.0304**	**0.0574**	**1.0000e-004**	**0.0102**	**1.6000e-004**	**0.0103**	**5.5900e-003**	**1.6000e-004**	**5.7500e-003**	**0.0000**	**8.6900**	**8.6900**	**2.7100e-003**	**0.0000**	**8.7576**

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	1.9000e-004	1.5000e-004	1.4800e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3362	0.3362	1.0000e-005	0.0000	0.3365
Total	**1.9000e-004**	**1.5000e-004**	**1.4800e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3362**	**0.3362**	**1.0000e-005**	**0.0000**	**0.3365**

3.4 Grading - 2018

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					0.0274	0.0000	0.0274	0.0136	0.0000	0.0136	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0111	0.1227	0.0663	1.2000e-004		6.2100e-003	6.2100e-003		5.7100e-003	5.7100e-003	0.0000	10.8428	10.8428	3.3800e-003	0.0000	10.9271
Total	**0.0111**	**0.1227**	**0.0663**	**1.2000e-004**	**0.0274**	**6.2100e-003**	**0.0336**	**0.0136**	**5.7100e-003**	**0.0194**	**0.0000**	**10.8428**	**10.8428**	**3.3800e-003**	**0.0000**	**10.9271**

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	0.0120	0.4107	0.0680	1.0200e-003	0.0213	1.5500e-003	0.0228	5.8600e-003	1.4800e-003	7.3400e-003	0.0000	98.2015	98.2015	5.1800e-003	0.0000	98.3309
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	2.5000e-004	2.0000e-004	1.9700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4483	0.4483	1.0000e-005	0.0000	0.4486
Total	**0.0122**	**0.4109**	**0.0700**	**1.0200e-003**	**0.0218**	**1.5500e-003**	**0.0233**	**5.9900e-003**	**1.4800e-003**	**7.4700e-003**	**0.0000**	**98.6497**	**98.6497**	**5.1900e-003**	**0.0000**	**98.7795**

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					6.1500e-003	0.0000	6.1500e-003	3.0700e-003	0.0000	3.0700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0413	0.0760	1.2000e-004		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	10.8427	10.8427	3.3800e-003	0.0000	10.9271
Total	**2.0800e-003**	**0.0413**	**0.0760**	**1.2000e-004**	**6.1500e-003**	**1.9000e-004**	**6.3400e-003**	**3.0700e-003**	**1.9000e-004**	**3.2600e-003**	**0.0000**	**10.8427**	**10.8427**	**3.3800e-003**	**0.0000**	**10.9271**

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	0.0120	0.4107	0.0680	1.0200e-003	0.0213	1.5500e-003	0.0228	5.8600e-003	1.4800e-003	7.3400e-003	0.0000	98.2015	98.2015	5.1800e-003	0.0000	98.3309
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	2.5000e-004	2.0000e-004	1.9700e-003	0.0000	4.7000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4483	0.4483	1.0000e-005	0.0000	0.4486

Total	**0.0122**	**0.4109**	**0.0700**	**1.0200e-003**	**0.0218**	**1.5500e-003**	**0.0233**	**5.9900e-003**	**1.4800e-003**	**7.4700e-003**	**0.0000**	**98.6497**	**98.6497**	**5.1900e-003**	**0.0000**	**98.7795**

3.5 Building Construction - 2018

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	0.2479	2.1636	1.6262	2.4900e-003		0.1387	0.1387		0.1304	0.1304	0.0000	219.9347	219.9347	0.0539	0.0000	221.2818
Total	**0.2479**	**2.1636**	**1.6262**	**2.4900e-003**		**0.1387**	**0.1387**		**0.1304**	**0.1304**	**0.0000**	**219.9347**	**219.9347**	**0.0539**	**0.0000**	**221.2818**

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	0.0170	0.4613	0.1054	9.6000e-004	0.0225	3.2900e-003	0.0258	6.5000e-003	3.1500e-003	9.6500e-003	0.0000	91.7916	91.7916	5.8700e-003	0.0000	91.9384
Worker	0.0593	0.0466	0.4647	1.1700e-003	0.1119	8.2000e-004	0.1127	0.0298	7.5000e-004	0.0305	0.0000	105.7388	105.7388	3.3200e-003	0.0000	105.8217
Total	**0.0763**	**0.5079**	**0.5700**	**2.1300e-003**	**0.1344**	**4.1100e-003**	**0.1385**	**0.0363**	**3.9000e-003**	**0.0402**	**0.0000**	**197.5303**	**197.5303**	**9.1900e-003**	**0.0000**	**197.7601**

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	0.0494	1.0094	1.6533	2.4900e-003		7.8300e-003	7.8300e-003		7.8300e-003	7.8300e-003	0.0000	219.9344	219.9344	0.0539	0.0000	221.2815
Total	**0.0494**	**1.0094**	**1.6533**	**2.4900e-003**		**7.8300e-003**	**7.8300e-003**		**7.8300e-003**	**7.8300e-003**	**0.0000**	**219.9344**	**219.9344**	**0.0539**	**0.0000**	**221.2815**

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	0.0170	0.4613	0.1054	9.6000e-004	0.0225	3.2900e-003	0.0258	6.5000e-003	3.1500e-003	9.6500e-003	0.0000	91.7916	91.7916	5.8700e-003	0.0000	91.9384
Worker	0.0593	0.0466	0.4647	1.1700e-003	0.1119	8.2000e-004	0.1127	0.0298	7.5000e-004	0.0305	0.0000	105.7388	105.7388	3.3200e-003	0.0000	105.8217
Total	**0.0763**	**0.5079**	**0.5700**	**2.1300e-003**	**0.1344**	**4.1100e-003**	**0.1385**	**0.0363**	**3.9000e-003**	**0.0402**	**0.0000**	**197.5303**	**197.5303**	**9.1900e-003**	**0.0000**	**197.7601**

3.5 Building Construction - 2019

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	0.0531	0.4743	0.3862	6.1000e-004		0.0290	0.0290		0.0273	0.0273	0.0000	52.8984	52.8984	0.0129	0.0000	53.2206
Total	**0.0531**	**0.4743**	**0.3862**	**6.1000e-004**		**0.0290**	**0.0290**		**0.0273**	**0.0273**	**0.0000**	**52.8984**	**52.8984**	**0.0129**	**0.0000**	**53.2206**

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	3.7500e-003	0.1065	0.0236	2.3000e-004	5.4700e-003	6.8000e-004	6.1500e-003	1.5800e-003	6.5000e-004	2.2300e-003	0.0000	22.1757	22.1757	1.3700e-003	0.0000	22.2099
Worker	0.0130	9.9400e-003	0.1004	2.8000e-004	0.0272	1.9000e-004	0.0274	7.2400e-003	1.8000e-004	7.4200e-003	0.0000	24.9682	24.9682	7.1000e-004	0.0000	24.9860
Total	**0.0168**	**0.1164**	**0.1240**	**5.1000e-004**	**0.0327**	**8.7000e-004**	**0.0336**	**8.8200e-003**	**8.3000e-004**	**9.6500e-003**	**0.0000**	**47.1439**	**47.1439**	**2.0800e-003**	**0.0000**	**47.1959**

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	0.0120	0.2455	0.4022	6.1000e-004		1.9000e-003	1.9000e-003		1.9000e-003	1.9000e-003	0.0000	52.8984	52.8984	0.0129	0.0000	53.2206
Total	**0.0120**	**0.2455**	**0.4022**	**6.1000e-004**		**1.9000e-003**	**1.9000e-003**		**1.9000e-003**	**1.9000e-003**	**0.0000**	**52.8984**	**52.8984**	**0.0129**	**0.0000**	**53.2206**

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	3.7500e-003	0.1065	0.0236	2.3000e-004	5.4700e-003	6.8000e-004	6.1500e-003	1.5800e-003	6.5000e-004	2.2300e-003	0.0000	22.1757	22.1757	1.3700e-003	0.0000	22.2099
Worker	0.0130	9.9400e-003	0.1004	2.8000e-004	0.0272	1.9000e-004	0.0274	7.2400e-003	1.8000e-004	7.4200e-003	0.0000	24.9682	24.9682	7.1000e-004	0.0000	24.9860
Total	**0.0168**	**0.1164**	**0.1240**	**5.1000e-004**	**0.0327**	**8.7000e-004**	**0.0336**	**8.8200e-003**	**8.3000e-004**	**9.6500e-003**	**0.0000**	**47.1439**	**47.1439**	**2.0800e-003**	**0.0000**	**47.1959**

3.6 Paving - 2019

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	0.0114	0.1148	0.1108	1.7000e-004		6.4800e-003	6.4800e-003		5.9700e-003	5.9700e-003	0.0000	15.0501	15.0501	4.6300e-003	0.0000	15.1658
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0114**	**0.1148**	**0.1108**	**1.7000e-004**		**6.4800e-003**	**6.4800e-003**		**5.9700e-003**	**5.9700e-003**	**0.0000**	**15.0501**	**15.0501**	**4.6300e-003**	**0.0000**	**15.1658**

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	6.8000e-004	5.2000e-004	5.2500e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.3055	1.3055	4.0000e-005	0.0000	1.3065
Total	**6.8000e-004**	**5.2000e-004**	**5.2500e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.3055**	**1.3055**	**4.0000e-005**	**0.0000**	**1.3065**

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	3.4100e-003	0.0756	0.1260	1.7000e-004		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004	0.0000	15.0501	15.0501	4.6300e-003	0.0000	15.1658
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.4100e-003**	**0.0756**	**0.1260**	**1.7000e-004**		**4.6000e-004**	**4.6000e-004**		**4.6000e-004**	**4.6000e-004**	**0.0000**	**15.0501**	**15.0501**	**4.6300e-003**	**0.0000**	**15.1658**

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	6.8000e-004	5.2000e-004	5.2500e-003	1.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.3055	1.3055	4.0000e-005	0.0000	1.3065

Total	**6.8000e-004**	**5.2000e-004**	**5.2500e-003**	**1.0000e-005**	**1.4200e-003**	**1.0000e-005**	**1.4300e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.3055**	**1.3055**	**4.0000e-005**	**0.0000**	**1.3065**

3.7 Architectural Coating - 2019

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	1.1241					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4000e-003	0.0165	0.0166	3.0000e-005		1.1600e-003	1.1600e-003		1.1600e-003	1.1600e-003	0.0000	2.2979	2.2979	1.9000e-004	0.0000	2.3028
Total	**1.1265**	**0.0165**	**0.0166**	**3.0000e-005**		**1.1600e-003**	**1.1600e-003**		**1.1600e-003**	**1.1600e-003**	**0.0000**	**2.2979**	**2.2979**	**1.9000e-004**	**0.0000**	**2.3028**

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	1.0600e-003	8.1000e-004	8.1400e-003	2.0000e-005	2.2100e-003	2.0000e-005	2.2200e-003	5.9000e-004	1.0000e-005	6.0000e-004	0.0000	2.0236	2.0236	6.0000e-005	0.0000	2.0250
Total	**1.0600e-003**	**8.1000e-004**	**8.1400e-003**	**2.0000e-005**	**2.2100e-003**	**2.0000e-005**	**2.2200e-003**	**5.9000e-004**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**2.0236**	**2.0236**	**6.0000e-005**	**0.0000**	**2.0250**

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	1.1241					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9000e-004	9.5400e-003	0.0165	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.2979	2.2979	1.9000e-004	0.0000	2.3028
Total	**1.1246**	**9.5400e-003**	**0.0165**	**3.0000e-005**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**2.2979**	**2.2979**	**1.9000e-004**	**0.0000**	**2.3028**

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	1.0600e-003	8.1000e-004	8.1400e-003	2.0000e-005	2.2100e-003	2.0000e-005	2.2200e-003	5.9000e-004	1.0000e-005	6.0000e-004	0.0000	2.0236	2.0236	6.0000e-005	0.0000	2.0250
Total	**1.0600e-003**	**8.1000e-004**	**8.1400e-003**	**2.0000e-005**	**2.2100e-003**	**2.0000e-005**	**2.2200e-003**	**5.9000e-004**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**2.0236**	**2.0236**	**6.0000e-005**	**0.0000**	**2.0250**

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	0.5774	3.6424	6.0677	0.0200	1.4565	0.0242	1.4807	0.3916	0.0229	0.4144	0.0000	1,840.9353	1,840.9353	0.0881	0.0000	1,843.1376
Unmitigated	0.5774	3.6424	6.0677	0.0200	1.4565	0.0242	1.4807	0.3916	0.0229	0.4144	0.0000	1,840.9353	1,840.9353	0.0881	0.0000	1,843.1376

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	330.88	357.12	302.72	763,569	763,569
Condo/Townhouse	323.28	314.64	268.56	725,745	725,745
Day-Care Center	193.30	16.21	15.22	167,881	167,881
Enclosed Parking with Elevator	0.00	0.00	0.00		
Fast Food Restaurant w/o Drive Thru	578.00	560.98	403.00	1,061,767	1,061,767
Regional Shopping Center	592.11	691.31	349.17	1,175,134	1,175,134
Total	2,017.56	1,940.25	1,338.67	3,894,096	3,894,096

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 Low Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Fast Food Restaurant w/o Drive Thru	9.50	7.30	7.30	1.50	79.50	19.00	63	37	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	65	35	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Condo/Townhouse	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Day-Care Center	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Enclosed Parking with Elevator	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Fast Food Restaurant w/o Drive Thru	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759
Regional Shopping Center	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759

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	225.8860	225.8860	0.0226	4.6700e-003	227.8434
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	225.8860	225.8860	0.0226	4.6700e-003	227.8434
NaturalGas Mitigated	0.0229	0.1965	0.0920	1.2500e-003		0.0158	0.0158		0.0158	0.0158	0.0000	226.1484	226.1484	4.3300e-003	4.1500e-003	227.4922
NaturalGas Unmitigated	0.0229	0.1965	0.0920	1.2500e-003		0.0158	0.0158		0.0158	0.0158	0.0000	226.1484	226.1484	4.3300e-003	4.1500e-003	227.4922

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 Low Rise	1.80518e+006	9.7300e-003	0.0832	0.0354	5.3000e-004		6.7300e-003	6.7300e-003		6.7300e-003	6.7300e-003	0.0000	96.3312	96.3312	1.8500e-003	1.7700e-003	96.9036
Condo/Townhouse	2.02056e+006	0.0109	0.0931	0.0396	5.9000e-004		7.5300e-003	7.5300e-003		7.5300e-003	7.5300e-003	0.0000	107.8248	107.8248	2.0700e-003	1.9800e-003	108.4656
Day-Care Center	43195.5	2.3000e-004	2.1200e-003	1.7800e-003	1.0000e-005		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	2.3051	2.3051	4.0000e-005	4.0000e-005	2.3188
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
Fast Food Restaurant w/o Drive-Thru	260586	1.4100e-003	0.0128	0.0107	8.0000e-005		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	13.9059	13.9059	2.7000e-004	2.5000e-004	13.9885
Regional Shopping Center	108339	5.8000e-004	5.3100e-003	4.4600e-003	3.0000e-005		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	5.7814	5.7814	1.1000e-004	1.1000e-004	5.8157
Total		**0.0229**	**0.1965**	**0.0920**	**1.2400e-003**		**0.0158**	**0.0158**		**0.0158**	**0.0158**	**0.0000**	**226.1484**	**226.1484**	**4.3400e-003**	**4.1500e-003**	**227.4922**

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 Low Rise	1.80518e+006	9.7300e-003	0.0832	0.0354	5.3000e-004		6.7300e-003	6.7300e-003		6.7300e-003	6.7300e-003	0.0000	96.3312	96.3312	1.8500e-003	1.7700e-003	96.9036
Condo/Townhouse	2.02056e+006	0.0109	0.0931	0.0396	5.9000e-004		7.5300e-003	7.5300e-003		7.5300e-003	7.5300e-003	0.0000	107.8248	107.8248	2.0700e-003	1.9800e-003	108.4656
Day-Care Center	43195.5	2.3000e-004	2.1200e-003	1.7800e-003	1.0000e-005		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	2.3051	2.3051	4.0000e-005	4.0000e-005	2.3188
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
Fast Food Restaurant w/o Drive-Thru	260586	1.4100e-003	0.0128	0.0107	8.0000e-005		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	13.9059	13.9059	2.7000e-004	2.5000e-004	13.9885
Regional Shopping Center	108339	5.8000e-004	5.3100e-003	4.4600e-003	3.0000e-005		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	5.7814	5.7814	1.1000e-004	1.1000e-004	5.8157
Total		**0.0229**	**0.1965**	**0.0920**	**1.2400e-003**		**0.0158**	**0.0158**		**0.0158**	**0.0158**	**0.0000**	**226.1484**	**226.1484**	**4.3400e-003**	**4.1500e-003**	**227.4922**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	288228	37.9140	3.7900e-003	7.8000e-004	38.2426
Condo/Townhouse	384646	50.5971	5.0600e-003	1.0500e-003	51.0355
Day-Care Center	11849.4	1.5587	1.6000e-004	3.0000e-005	1.5722
Enclosed Parking with Elevator	736008	96.8158	9.6800e-003	2.0000e-003	97.6548
Fast Food Restaurant w/o Drive Thru	45337.5	5.9638	6.0000e-004	1.2000e-004	6.0155
Regional Shopping Center	251150	33.0367	3.3000e-003	6.8000e-004	33.3229
Total		**225.8860**	**0.0226**	**4.6600e-003**	**227.8434**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	288228	37.9140	3.7900e-003	7.8000e-004	38.2426
Condo/Townhouse	384646	50.5971	5.0600e-003	1.0500e-003	51.0355
Day-Care Center	11849.4	1.5587	1.6000e-004	3.0000e-005	1.5722
Enclosed Parking with Elevator	736008	96.8158	9.6800e-003	2.0000e-003	97.6548
Fast Food Restaurant w/o Drive Thru	45337.5	5.9638	6.0000e-004	1.2000e-004	6.0155
Regional Shopping Center	251150	33.0367	3.3000e-003	6.8000e-004	33.3229

Total		**225.8860**	**0.0226**	**4.6600e-003**	**227.8434**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7901	0.0164	1.0180	8.0000e-005		5.9600e-003	5.9600e-003		5.9600e-003	5.9600e-003	0.0000	7.0879	7.0879	1.7300e-003	1.0000e-004	7.1608
Unmitigated	0.7901	0.0164	1.0180	8.0000e-005		5.9600e-003	5.9600e-003		5.9600e-003	5.9600e-003	0.0000	7.0879	7.0879	1.7300e-003	1.0000e-004	7.1608

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	0.1124					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6460					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.5000e-004	4.6900e-003	2.0000e-003	3.0000e-005		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	5.4330	5.4330	1.0000e-004	1.0000e-004	5.4653
Landscaping	0.0311	0.0117	1.0160	5.0000e-005		5.5800e-003	5.5800e-003		5.5800e-003	5.5800e-003	0.0000	1.6549	1.6549	1.6200e-003	0.0000	1.6955

Total	**0.7901**	**0.0164**	**1.0180**	**8.0000e-005**		**5.9600e-003**	**5.9600e-003**		**5.9600e-003**	**5.9600e-003**	**0.0000**	**7.0879**	**7.0879**	**1.7200e-003**	**1.0000e-004**	**7.1608**

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	0.1124					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6460					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.5000e-004	4.6900e-003	2.0000e-003	3.0000e-005		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	5.4330	5.4330	1.0000e-004	1.0000e-004	5.4653
Landscaping	0.0311	0.0117	1.0160	5.0000e-005		5.5800e-003	5.5800e-003		5.5800e-003	5.5800e-003	0.0000	1.6549	1.6549	1.6200e-003	0.0000	1.6955
Total	**0.7901**	**0.0164**	**1.0180**	**8.0000e-005**		**5.9600e-003**	**5.9600e-003**		**5.9600e-003**	**5.9600e-003**	**0.0000**	**7.0879**	**7.0879**	**1.7200e-003**	**1.0000e-004**	**7.1608**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	14.7133	0.3654	8.8300e-003	26.4813
Unmitigated	14.7133	0.3654	8.8300e-003	26.4813

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	4.16986 / 2.62882	5.5012	0.1363	3.2900e-003	9.8904
Condo/Townhouse	4.69109 / 2.95743	6.1888	0.1533	3.7100e-003	11.1266
Day-Care Center	0.111942 / 0.28785	0.2477	3.6700e-003	9.0000e-005	0.3664
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0.470477 / 0.0300305	0.4980	0.0154	3.7000e-004	0.9921
Regional Shopping Center	1.737 / 1.06461	2.2776	0.0568	1.3700e-003	4.1058
Total		**14.7133**	**0.3654**	**8.8300e-003**	**26.4813**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	4.16986 / 2.62882	5.5012	0.1363	3.2900e-003	9.8904
Condo/Townhouse	4.69109 / 2.95743	6.1888	0.1533	3.7100e-003	11.1266
Day-Care Center	0.111942 / 0.28785	0.2477	3.6700e-003	9.0000e-005	0.3664
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000

Fast Food Restaurant w/o Drive Thru	0.470477 / 0.0300305	0.4980	0.0154	3.7000e-004	0.9921
Regional Shopping Center	1.737 / 1.06461	2.2776	0.0568	1.3700e-003	4.1058
Total		**14.7133**	**0.3654**	**8.8300e-003**	**26.4813**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	22.0083	1.3007	0.0000	54.5246
Unmitigated	22.0083	1.3007	0.0000	54.5246

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	29.44	5.9761	0.3532	0.0000	14.8054
Condo/Townhouse	33.12	6.7231	0.3973	0.0000	16.6561

Day-Care Center	3.39	0.6881	0.0407	0.0000	1.7048
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	17.85	3.6234	0.2141	0.0000	8.9768
Regional Shopping Center	24.62	4.9976	0.2954	0.0000	12.3814
Total		**22.0083**	**1.3007**	**0.0000**	**54.5246**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	29.44	5.9761	0.3532	0.0000	14.8054
Condo/Townhouse	33.12	6.7231	0.3973	0.0000	16.6561
Day-Care Center	3.39	0.6881	0.0407	0.0000	1.7048
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	17.85	3.6234	0.2141	0.0000	8.9768
Regional Shopping Center	24.62	4.9976	0.2954	0.0000	12.3814
Total		**22.0083**	**1.3007**	**0.0000**	**54.5246**

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

Silicon Sage - Existing Run

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Regional Shopping Center	43.47	1000sqft	4.50	43,468.00	0
Quality Restaurant	7.84	1000sqft	0.00	7,843.00	0
Unrefrigerated Warehouse-No Rail	0.97	1000sqft	0.00	970.00	0
Single Family Housing	1.00	Dwelling Unit	0.00	1,800.00	3

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2019
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 rate

Land Use - Land uses from project traffic report

Vehicle Trips - Trip rates from project traffic report. Pass-bys (accounted for in trip reductions) set to zero.

Woodstoves - No woodstoves or fireplaces, possible gas-powered fireplaces

Energy Use - default

Table Name	Column Name	Default Value	New Value
tblFireplaces	FireplaceWoodMass	228.80	0.00

tblFireplaces	NumberGas	0.25	0.68
tblFireplaces	NumberWood	0.43	0.00
tblLandUse	LotAcreage	1.00	4.50
tblLandUse	LotAcreage	0.18	0.00
tblLandUse	LotAcreage	0.02	0.00
tblLandUse	LotAcreage	0.32	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	ST_TR	94.36	63.22
tblVehicleTrips	ST_TR	49.97	43.97
tblVehicleTrips	ST_TR	1.68	2.50
tblVehicleTrips	SU_TR	72.16	48.35
tblVehicleTrips	SU_TR	25.24	22.21
tblVehicleTrips	SU_TR	1.68	2.50
tblVehicleTrips	WD_TR	89.95	60.56
tblVehicleTrips	WD_TR	42.70	37.41
tblVehicleTrips	WD_TR	1.68	2.50
tblWoodstoves	NumberCatalytic	0.04	0.00
tblWoodstoves	NumberNoncatalytic	0.04	0.00
tblWoodstoves	WoodstoveDayYear	21.06	0.00
tblWoodstoves	WoodstoveWoodMass	956.80	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	0.2400	1.6000e-004	7.9800e-003	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0980	0.0980	2.0000e-005	0.0000	0.0988
Energy	8.4900e-003	0.0770	0.0637	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	177.0031	177.0031	0.0109	3.4600e-003	178.3083
Mobile	0.6325	3.7267	6.1629	0.0180	1.2482	0.0251	1.2733	0.3356	0.0237	0.3593	0.0000	1,652.9509	1,652.9509	0.0907	0.0000	1,655.2178
Waste						0.0000	0.0000		0.0000	0.0000	11.1564	0.0000	11.1564	0.6593	0.0000	27.6395
Water						0.0000	0.0000		0.0000	0.0000	1.8683	5.1891	7.0575	0.1924	4.6400e-003	13.2501
Total	**0.8810**	**3.8039**	**6.2346**	**0.0184**	**1.2482**	**0.0310**	**1.2792**	**0.3356**	**0.0296**	**0.3652**	**13.0247**	**1,835.2411**	**1,848.2658**	**0.9534**	**8.1000e-003**	**1,874.5145**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2400	1.6000e-004	7.9800e-003	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0980	0.0980	2.0000e-005	0.0000	0.0988
Energy	8.4900e-003	0.0770	0.0637	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	177.0031	177.0031	0.0109	3.4600e-003	178.3083
Mobile	0.6325	3.7267	6.1629	0.0180	1.2482	0.0251	1.2733	0.3356	0.0237	0.3593	0.0000	1,652.9509	1,652.9509	0.0907	0.0000	1,655.2178
Waste						0.0000	0.0000		0.0000	0.0000	11.1564	0.0000	11.1564	0.6593	0.0000	27.6395
Water						0.0000	0.0000		0.0000	0.0000	1.8683	5.1891	7.0575	0.1924	4.6400e-003	13.2501
Total	**0.8810**	**3.8039**	**6.2346**	**0.0184**	**1.2482**	**0.0310**	**1.2792**	**0.3356**	**0.0296**	**0.3652**	**13.0247**	**1,835.2411**	**1,848.2658**	**0.9534**	**8.1000e-003**	**1,874.5145**

	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	0.6325	3.7267	6.1629	0.0180	1.2482	0.0251	1.2733	0.3356	0.0237	0.3593	0.0000	1,652.9509	1,652.9509	0.0907	0.0000	1,655.2178
Unmitigated	0.6325	3.7267	6.1629	0.0180	1.2482	0.0251	1.2733	0.3356	0.0237	0.3593	0.0000	1,652.9509	1,652.9509	0.0907	0.0000	1,655.2178

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Quality Restaurant	474.97	495.83	379.21	550,704	550,704
Regional Shopping Center	1,626.14	1,911.29	965.42	2,757,047	2,757,047
Single Family Housing	9.52	9.91	8.62	21,819	21,819
Unrefrigerated Warehouse-No Rail	2.43	2.43	2.43	7,080	7,080
Total	2,113.05	2,419.46	1,355.68	3,336,650	3,336,650

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
Quality Restaurant	9.50	7.30	7.30	12.00	69.00	19.00	38	18	44
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Unrefrigerated Warehouse-No Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Regional Shopping Center	0.556416	0.041967	0.190895	0.111485	0.018156	0.005234	0.022193	0.041963	0.002079	0.002948	0.005586	0.000300	0.000779
Quality Restaurant	0.556416	0.041967	0.190895	0.111485	0.018156	0.005234	0.022193	0.041963	0.002079	0.002948	0.005586	0.000300	0.000779
Unrefrigerated Warehouse-No Rail	0.556416	0.041967	0.190895	0.111485	0.018156	0.005234	0.022193	0.041963	0.002079	0.002948	0.005586	0.000300	0.000779
Single Family Housing	0.556416	0.041967	0.190895	0.111485	0.018156	0.005234	0.022193	0.041963	0.002079	0.002948	0.005586	0.000300	0.000779

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	93.0290	93.0290	9.3000e-003	1.9200e-003	93.8352
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	93.0290	93.0290	9.3000e-003	1.9200e-003	93.8352
NaturalGas Mitigated	8.4900e-003	0.0770	0.0637	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	83.9741	83.9741	1.6100e-003	1.5400e-003	84.4731
NaturalGas Unmitigated	8.4900e-003	0.0770	0.0637	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	83.9741	83.9741	1.6100e-003	1.5400e-003	84.4731

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					
Quality Restaurant	1.31857e+006	7.1100e-003	0.0646	0.0543	3.9000e-004		4.9100e-003	4.9100e-003		4.9100e-003	4.9100e-003	0.0000	70.3637	70.3637	1.3500e-003	1.2900e-003	70.7818
Regional Shopping Center	200822	1.0800e-003	9.8400e-003	8.2700e-003	6.0000e-005		7.5000e-004	7.5000e-004		7.5000e-004	7.5000e-004	0.0000	10.7166	10.7166	2.1000e-004	2.0000e-004	10.7803
Single Family Housing	52879.3	2.9000e-004	2.4400e-003	1.0400e-003	2.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.8218	2.8218	5.0000e-005	5.0000e-005	2.8386
Unrefrigerated Warehouse-No Rail	1348.3	1.0000e-005	7.0000e-005	6.0000e-005	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	0.0720	0.0720	0.0000	0.0000	0.0724
Total		**8.4900e-003**	**0.0770**	**0.0637**	**4.7000e-004**		**5.8700e-003**	**5.8700e-003**		**5.8700e-003**	**5.8700e-003**	**0.0000**	**83.9741**	**83.9741**	**1.6100e-003**	**1.5400e-003**	**84.4731**

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					
Quality Restaurant	1.31857e+006	7.1100e-003	0.0646	0.0543	3.9000e-004		4.9100e-003	4.9100e-003		4.9100e-003	4.9100e-003	0.0000	70.3637	70.3637	1.3500e-003	1.2900e-003	70.7818
Regional Shopping Center	200822	1.0800e-003	9.8400e-003	8.2700e-003	6.0000e-005		7.5000e-004	7.5000e-004		7.5000e-004	7.5000e-004	0.0000	10.7166	10.7166	2.1000e-004	2.0000e-004	10.7803
Single Family Housing	52879.3	2.9000e-004	2.4400e-003	1.0400e-003	2.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.8218	2.8218	5.0000e-005	5.0000e-005	2.8386
Unrefrigerated Warehouse-No Rail	1348.3	1.0000e-005	7.0000e-005	6.0000e-005	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	0.0720	0.0720	0.0000	0.0000	0.0724
Total		**8.4900e-003**	**0.0770**	**0.0637**	**4.7000e-004**		**5.8700e-003**	**5.8700e-003**		**5.8700e-003**	**5.8700e-003**	**0.0000**	**83.9741**	**83.9741**	**1.6100e-003**	**1.5400e-003**	**84.4731**

5.3 Energy by Land Use - Electricity

Unmitigated

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

Quality Restaurant	229408	30.1767	3.0200e-003	6.2000e-004	30.4382
Regional Shopping Center	465542	61.2383	6.1200e-003	1.2700e-003	61.7689
Single Family Housing	8535.77	1.1228	1.1000e-004	2.0000e-005	1.1325
Unrefrigerated Warehouse-No Rail	3734.5	0.4912	5.0000e-005	1.0000e-005	0.4955
Total		**93.0290**	**9.3000e-003**	**1.9200e-003**	**93.8352**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Quality Restaurant	229408	30.1767	3.0200e-003	6.2000e-004	30.4382
Regional Shopping Center	465542	61.2383	6.1200e-003	1.2700e-003	61.7689
Single Family Housing	8535.77	1.1228	1.1000e-004	2.0000e-005	1.1325
Unrefrigerated Warehouse-No Rail	3734.5	0.4912	5.0000e-005	1.0000e-005	0.4955
Total		**93.0290**	**9.3000e-003**	**1.9200e-003**	**93.8352**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2400	1.6000e-004	7.9800e-003	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0980	0.0980	2.0000e-005	0.0000	0.0988
Unmitigated	0.2400	1.6000e-004	7.9800e-003	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0980	0.0980	2.0000e-005	0.0000	0.0988

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	0.0285					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2112					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.0000e-005	7.0000e-005	3.0000e-005	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	0.0849	0.0849	0.0000	0.0000	0.0854
Landscaping	2.7000e-004	9.0000e-005	7.9500e-003	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0131	0.0131	1.0000e-005	0.0000	0.0134
Total	**0.2400**	**1.6000e-004**	**7.9800e-003**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0980**	**0.0980**	**1.0000e-005**	**0.0000**	**0.0988**

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	0.0285					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2112					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.0000e-005	7.0000e-005	3.0000e-005	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	0.0849	0.0849	0.0000	0.0000	0.0854
Landscaping	2.7000e-004	9.0000e-005	7.9500e-003	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0131	0.0131	1.0000e-005	0.0000	0.0134
Total	**0.2400**	**1.6000e-004**	**7.9800e-003**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0980**	**0.0980**	**1.0000e-005**	**0.0000**	**0.0988**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	7.0575	0.1924	4.6400e-003	13.2501
Unmitigated	7.0575	0.1924	4.6400e-003	13.2501

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Quality Restaurant	2.3797 / 0.151896	2.5187	0.0777	1.8700e-003	5.0182

Regional Shopping Center	3.21993 / 1.97351	4.2220	0.1052	2.5400e-003	7.6110
Single Family Housing	0.065154 / 0.0410754	0.0860	2.1300e-003	5.0000e-005	0.1545
Unrefrigerated Warehouse-No Rail	0.224313 / 0	0.2308	7.3300e-003	1.8000e-004	0.4664
Total		**7.0575**	**0.1924**	**4.6400e-003**	**13.2501**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Quality Restaurant	2.3797 / 0.151896	2.5187	0.0777	1.8700e-003	5.0182
Regional Shopping Center	3.21993 / 1.97351	4.2220	0.1052	2.5400e-003	7.6110
Single Family Housing	0.065154 / 0.0410754	0.0860	2.1300e-003	5.0000e-005	0.1545
Unrefrigerated Warehouse-No Rail	0.224313 / 0	0.2308	7.3300e-003	1.8000e-004	0.4664
Total		**7.0575**	**0.1924**	**4.6400e-003**	**13.2501**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e

	MT/yr			
Mitigated	11.1564	0.6593	0.0000	27.6395
Unmitigated	11.1564	0.6593	0.0000	27.6395

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Quality Restaurant	7.15	1.4514	0.0858	0.0000	3.5958
Regional Shopping Center	45.64	9.2645	0.5475	0.0000	22.9524
Single Family Housing	1.26	0.2558	0.0151	0.0000	0.6337
Unrefrigerated Warehouse-No Rail	0.91	0.1847	0.0109	0.0000	0.4576
Total		**11.1564**	**0.6593**	**0.0000**	**27.6395**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Quality Restaurant	7.15	1.4514	0.0858	0.0000	3.5958
Regional Shopping Center	45.64	9.2645	0.5475	0.0000	22.9524

Single Family Housing	1.26	0.2558	0.0151	0.0000	0.6337
Unrefrigerated Warehouse-No Rail	0.91	0.1847	0.0109	0.0000	0.4576
Total		**11.1564**	**0.6593**	**0.0000**	**27.6395**

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

Silicon Sage - Centerville, Construction and Operations

Alameda County, Annual

Construction TAC Analysis

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	2.61	1000sqft	0.00	2,610.00	0
Enclosed Parking with Elevator	273.00	Space	0.00	109,200.00	0
Fast Food Restaurant w/o Drive Thru	1.55	1000sqft	0.00	1,550.00	0
Apartments Low Rise	64.00	Dwelling Unit	0.00	64,000.00	183
Condo/Townhouse	72.00	Dwelling Unit	4.50	72,000.00	206
Regional Shopping Center	23.45	1000sqft	0.00	23,450.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 carbon rate

Land Use - Land uses and site acreage from traffic report and plan drawings

Construction Phase - default, assume March 2018 start

Trips and VMT - on- and near-site construction

Demolition - Up to 55,000 sf of bldg demo

Grading - 20,100cy soil export

Vehicle Trips - Trip rates from project traffic report. Pass-by set to zero for retail since already included in trip reductions.

Woodstoves - No woodstoves, possible gas-powered fireplaces

Energy Use - default

Construction Off-road Equipment Mitigation - Tier 4 engines for equip > 25hp. BAAQMD BMPs.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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
tblEnergyUse	LightingElect	2.51	2.58
tblEnergyUse	LightingElect	1.75	2.63
tblEnergyUse	LightingElect	5.34	5.48
tblEnergyUse	LightingElect	4.88	5.00
tblEnergyUse	NT24E	3,172.76	3,418.36
tblEnergyUse	NT24E	3,795.01	4,109.59
tblEnergyUse	T24E	233.06	274.84
tblEnergyUse	T24E	204.52	231.62
tblEnergyUse	T24E	0.66	0.69
tblEnergyUse	T24E	2.67	2.80
tblEnergyUse	T24E	2.24	2.35
tblEnergyUse	T24NG	17,734.50	25,590.91
tblEnergyUse	T24NG	20,104.20	25,448.35
tblEnergyUse	T24NG	14.85	14.93
tblEnergyUse	T24NG	39.90	40.10
tblEnergyUse	T24NG	3.90	3.92
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	9.60	20.48
tblFireplaces	NumberGas	10.80	23.04
tblFireplaces	NumberWood	10.88	0.00
tblFireplaces	NumberWood	12.24	0.00
tblGrading	MaterialExported	0.00	20,100.00
tblLandUse	LotAcreage	0.06	0.00
tblLandUse	LotAcreage	2.46	0.00
tblLandUse	LotAcreage	0.04	0.00
tblLandUse	LotAcreage	4.00	0.00
tblLandUse	LotAcreage	0.54	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	HaulingTripLength	20.00	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50

tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	VendorTripLength	7.30	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblTripsAndVMT	WorkerTripLength	10.80	0.50
tblVehicleTrips	PB_TP	12.00	0.00
tblVehicleTrips	PB_TP	11.00	0.00
tblVehicleTrips	PR_TP	51.00	63.00
tblVehicleTrips	PR_TP	54.00	65.00
tblVehicleTrips	ST_TR	7.16	5.58
tblVehicleTrips	ST_TR	5.67	4.37
tblVehicleTrips	ST_TR	696.00	361.92
tblVehicleTrips	ST_TR	49.97	29.48
tblVehicleTrips	SU_TR	6.07	4.73
tblVehicleTrips	SU_TR	4.84	3.73
tblVehicleTrips	SU_TR	500.00	260.00
tblVehicleTrips	SU_TR	25.24	14.89
tblVehicleTrips	WD_TR	6.59	5.17
tblVehicleTrips	WD_TR	5.81	4.49
tblVehicleTrips	WD_TR	716.00	372.90
tblVehicleTrips	WD_TR	42.70	25.25
tblWoodstoves	NumberCatalytic	1.28	0.00
tblWoodstoves	NumberCatalytic	1.44	0.00
tblWoodstoves	NumberNoncatalytic	1.28	0.00
tblWoodstoves	NumberNoncatalytic	1.44	0.00
tblWoodstoves	WoodstoveDayYear	14.12	0.00
tblWoodstoves	WoodstoveDayYear	14.12	0.00
tblWoodstoves	WoodstoveWoodMass	582.40	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					
2018						0.1715		0.0447	0.1608	0.2054						
2019						0.0368		5.1000e-004	0.0345	0.0350						
Maximum						**0.1715**		**0.0447**	**0.1608**	**0.2054**						

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					
2018						9.4800e-003		0.0117	9.4500e-003	0.0211						
2019						2.5200e-003		5.1000e-004	2.5100e-003	3.0200e-003						
Maximum						**9.4800e-003**		**0.0117**	**9.4500e-003**	**0.0211**						

	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	**19.53**	**47.88**	**-3.41**	**0.00**	**70.75**	**94.24**	**86.16**	**73.02**	**93.88**	**89.96**	**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	3/1/2018	3/28/2018	5	20	
2	Site Preparation	Site Preparation	3/29/2018	4/4/2018	5	5	
3	Grading	Grading	4/5/2018	4/16/2018	5	8	
4	Building Construction	Building Construction	4/17/2018	3/4/2019	5	230	
5	Paving	Paving	3/5/2019	3/28/2019	5	18	
6	Architectural Coating	Architectural Coating	3/29/2019	4/23/2019	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 275,400; Residential Outdoor: 91,800; Non-Residential Indoor: 41,415; Non-Residential Outdoor: 13,805; 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
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
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38

Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	250.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	2,513.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Building Construction	9	153.00	37.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	31.00	0.00	0.00	0.50	0.50	0.50	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	0.50	0.50	0.50	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 - 2018

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					0.0271	0.0000	0.0271	4.1000e-003	0.0000	4.1000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0372	0.3832	0.2230	3.9000e-004		0.0194	0.0194		0.0181	0.0181	0.0000	35.1241	35.1241	9.6800e-003	0.0000	35.3660
Total	**0.0372**	**0.3832**	**0.2230**	**3.9000e-004**	**0.0271**	**0.0194**	**0.0465**	**4.1000e-003**	**0.0181**	**0.0222**	**0.0000**	**35.1241**	**35.1241**	**9.6800e-003**	**0.0000**	**35.3660**

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	2.9000e-004	0.0136	1.7900e-003	2.0000e-005	6.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	1.5233	1.5233	3.0000e-004	0.0000	1.5309
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	2.0000e-004	9.0000e-005	1.1900e-003	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0829	0.0829	1.0000e-005	0.0000	0.0831
Total	**4.9000e-004**	**0.0137**	**2.9800e-003**	**2.0000e-005**	**1.2000e-004**	**1.0000e-005**	**1.3000e-004**	**4.0000e-005**	**1.0000e-005**	**5.0000e-005**	**0.0000**	**1.6062**	**1.6062**	**3.1000e-004**	**0.0000**	**1.6140**

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					6.0900e-003	0.0000	6.0900e-003	9.2000e-004	0.0000	9.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.8400e-003	0.1356	0.2467	3.9000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	35.1240	35.1240	9.6800e-003	0.0000	35.3660
Total	**5.8400e-003**	**0.1356**	**0.2467**	**3.9000e-004**	**6.0900e-003**	**6.2000e-004**	**6.7100e-003**	**9.2000e-004**	**6.2000e-004**	**1.5400e-003**	**0.0000**	**35.1240**	**35.1240**	**9.6800e-003**	**0.0000**	**35.3660**

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	2.9000e-004	0.0136	1.7900e-003	2.0000e-005	6.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	1.5233	1.5233	3.0000e-004	0.0000	1.5309
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	2.0000e-004	9.0000e-005	1.1900e-003	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0829	0.0829	1.0000e-005	0.0000	0.0831
Total	**4.9000e-004**	**0.0137**	**2.9800e-003**	**2.0000e-005**	**1.2000e-004**	**1.0000e-005**	**1.3000e-004**	**4.0000e-005**	**1.0000e-005**	**5.0000e-005**	**0.0000**	**1.6062**	**1.6062**	**3.1000e-004**	**0.0000**	**1.6140**

3.3 Site Preparation - 2018

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					0.0452	0.0000	0.0452	0.0248	0.0000	0.0248	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.1205	0.0562	1.0000e-004		6.4400e-003	6.4400e-003		5.9300e-003	5.9300e-003	0.0000	8.6900	8.6900	2.7100e-003	0.0000	8.7576
Total	**0.0114**	**0.1205**	**0.0562**	**1.0000e-004**	**0.0452**	**6.4400e-003**	**0.0516**	**0.0248**	**5.9300e-003**	**0.0308**	**0.0000**	**8.6900**	**8.6900**	**2.7100e-003**	**0.0000**	**8.7576**

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	6.0000e-005	3.0000e-005	3.6000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0249	0.0249	0.0000	0.0000	0.0249
Total	**6.0000e-005**	**3.0000e-005**	**3.6000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0249**	**0.0249**	**0.0000**	**0.0000**	**0.0249**

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					0.0102	0.0000	0.0102	5.5900e-003	0.0000	5.5900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7400e-003	0.0304	0.0574	1.0000e-004		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	8.6900	8.6900	2.7100e-003	0.0000	8.7576
Total	**1.7400e-003**	**0.0304**	**0.0574**	**1.0000e-004**	**0.0102**	**1.6000e-004**	**0.0103**	**5.5900e-003**	**1.6000e-004**	**5.7500e-003**	**0.0000**	**8.6900**	**8.6900**	**2.7100e-003**	**0.0000**	**8.7576**

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	6.0000e-005	3.0000e-005	3.6000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0249	0.0249	0.0000	0.0000	0.0249
Total	**6.0000e-005**	**3.0000e-005**	**3.6000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0249**	**0.0249**	**0.0000**	**0.0000**	**0.0249**

3.4 Grading - 2018

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					0.0274	0.0000	0.0274	0.0136	0.0000	0.0136	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0111	0.1227	0.0663	1.2000e-004		6.2100e-003	6.2100e-003		5.7100e-003	5.7100e-003	0.0000	10.8428	10.8428	3.3800e-003	0.0000	10.9271
Total	**0.0111**	**0.1227**	**0.0663**	**1.2000e-004**	**0.0274**	**6.2100e-003**	**0.0336**	**0.0136**	**5.7100e-003**	**0.0194**	**0.0000**	**10.8428**	**10.8428**	**3.3800e-003**	**0.0000**	**10.9271**

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	2.9400e-003	0.1365	0.0180	1.6000e-004	5.6000e-004	1.4000e-004	7.0000e-004	1.6000e-004	1.3000e-004	2.9000e-004	0.0000	15.3123	15.3123	3.0500e-003	0.0000	15.3886
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	8.0000e-005	4.0000e-005	4.8000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0332	0.0332	0.0000	0.0000	0.0332
Total	**3.0200e-003**	**0.1366**	**0.0184**	**1.6000e-004**	**5.8000e-004**	**1.4000e-004**	**7.2000e-004**	**1.7000e-004**	**1.3000e-004**	**3.0000e-004**	**0.0000**	**15.3454**	**15.3454**	**3.0500e-003**	**0.0000**	**15.4218**

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					6.1500e-003	0.0000	6.1500e-003	3.0700e-003	0.0000	3.0700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0800e-003	0.0413	0.0760	1.2000e-004		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	10.8427	10.8427	3.3800e-003	0.0000	10.9271
Total	**2.0800e-003**	**0.0413**	**0.0760**	**1.2000e-004**	**6.1500e-003**	**1.9000e-004**	**6.3400e-003**	**3.0700e-003**	**1.9000e-004**	**3.2600e-003**	**0.0000**	**10.8427**	**10.8427**	**3.3800e-003**	**0.0000**	**10.9271**

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	2.9400e-003	0.1365	0.0180	1.6000e-004	5.6000e-004	1.4000e-004	7.0000e-004	1.6000e-004	1.3000e-004	2.9000e-004	0.0000	15.3123	15.3123	3.0500e-003	0.0000	15.3886
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	8.0000e-005	4.0000e-005	4.8000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0332	0.0332	0.0000	0.0000	0.0332
Total	**3.0200e-003**	**0.1366**	**0.0184**	**1.6000e-004**	**5.8000e-004**	**1.4000e-004**	**7.2000e-004**	**1.7000e-004**	**1.3000e-004**	**3.0000e-004**	**0.0000**	**15.3454**	**15.3454**	**3.0500e-003**	**0.0000**	**15.4218**

3.5 Building Construction - 2018

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	0.2479	2.1636	1.6262	2.4900e-003		0.1387	0.1387		0.1304	0.1304	0.0000	219.9347	219.9347	0.0539	0.0000	221.2818
Total	**0.2479**	**2.1636**	**1.6262**	**2.4900e-003**		**0.1387**	**0.1387**		**0.1304**	**0.1304**	**0.0000**	**219.9347**	**219.9347**	**0.0539**	**0.0000**	**221.2818**

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	6.7100e-003	0.2457	0.0583	2.5000e-004	1.6200e-003	4.1000e-004	2.0300e-003	4.8000e-004	3.9000e-004	8.7000e-004	0.0000	24.1056	24.1056	4.5200e-003	0.0000	24.2186
Worker	0.0191	8.5400e-003	0.1126	9.0000e-005	5.3100e-003	1.3000e-004	5.4400e-003	1.4300e-003	1.2000e-004	1.5500e-003	0.0000	7.8235	7.8235	6.0000e-004	0.0000	7.8385
Total	**0.0258**	**0.2542**	**0.1709**	**3.4000e-004**	**6.9300e-003**	**5.4000e-004**	**7.4700e-003**	**1.9100e-003**	**5.1000e-004**	**2.4200e-003**	**0.0000**	**31.9290**	**31.9290**	**5.1200e-003**	**0.0000**	**32.0570**

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	0.0494	1.0094	1.6533	2.4900e-003		7.8300e-003	7.8300e-003		7.8300e-003	7.8300e-003	0.0000	219.9344	219.9344	0.0539	0.0000	221.2815
Total	**0.0494**	**1.0094**	**1.6533**	**2.4900e-003**		**7.8300e-003**	**7.8300e-003**		**7.8300e-003**	**7.8300e-003**	**0.0000**	**219.9344**	**219.9344**	**0.0539**	**0.0000**	**221.2815**

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	6.7100e-003	0.2457	0.0583	2.5000e-004	1.6200e-003	4.1000e-004	2.0300e-003	4.8000e-004	3.9000e-004	8.7000e-004	0.0000	24.1056	24.1056	4.5200e-003	0.0000	24.2186
Worker	0.0191	8.5400e-003	0.1126	9.0000e-005	5.3100e-003	1.3000e-004	5.4400e-003	1.4300e-003	1.2000e-004	1.5500e-003	0.0000	7.8235	7.8235	6.0000e-004	0.0000	7.8385
Total	**0.0258**	**0.2542**	**0.1709**	**3.4000e-004**	**6.9300e-003**	**5.4000e-004**	**7.4700e-003**	**1.9100e-003**	**5.1000e-004**	**2.4200e-003**	**0.0000**	**31.9290**	**31.9290**	**5.1200e-003**	**0.0000**	**32.0570**

3.5 Building Construction - 2019

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	0.0531	0.4743	0.3862	6.1000e-004		0.0290	0.0290		0.0273	0.0273	0.0000	52.8984	52.8984	0.0129	0.0000	53.2206
Total	**0.0531**	**0.4743**	**0.3862**	**6.1000e-004**		**0.0290**	**0.0290**		**0.0273**	**0.0273**	**0.0000**	**52.8984**	**52.8984**	**0.0129**	**0.0000**	**53.2206**

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	1.5000e-003	0.0583	0.0130	6.0000e-005	3.9000e-004	9.0000e-005	4.8000e-004	1.2000e-004	8.0000e-005	2.0000e-004	0.0000	5.8516	5.8516	1.0500e-003	0.0000	5.8779
Worker	4.1900e-003	1.8100e-003	0.0243	2.0000e-005	1.2900e-003	3.0000e-005	1.3200e-003	3.5000e-004	3.0000e-005	3.8000e-004	0.0000	1.8501	1.8501	1.3000e-004	0.0000	1.8533
Total	**5.6900e-003**	**0.0601**	**0.0373**	**8.0000e-005**	**1.6800e-003**	**1.2000e-004**	**1.8000e-003**	**4.7000e-004**	**1.1000e-004**	**5.8000e-004**	**0.0000**	**7.7017**	**7.7017**	**1.1800e-003**	**0.0000**	**7.7311**

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	0.0120	0.2455	0.4022	6.1000e-004		1.9000e-003	1.9000e-003		1.9000e-003	1.9000e-003	0.0000	52.8984	52.8984	0.0129	0.0000	53.2206
Total	**0.0120**	**0.2455**	**0.4022**	**6.1000e-004**		**1.9000e-003**	**1.9000e-003**		**1.9000e-003**	**1.9000e-003**	**0.0000**	**52.8984**	**52.8984**	**0.0129**	**0.0000**	**53.2206**

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	1.5000e-003	0.0583	0.0130	6.0000e-005	3.9000e-004	9.0000e-005	4.8000e-004	1.2000e-004	8.0000e-005	2.0000e-004	0.0000	5.8516	5.8516	1.0500e-003	0.0000	5.8779
Worker	4.1900e-003	1.8100e-003	0.0243	2.0000e-005	1.2900e-003	3.0000e-005	1.3200e-003	3.5000e-004	3.0000e-005	3.8000e-004	0.0000	1.8501	1.8501	1.3000e-004	0.0000	1.8533
Total	**5.6900e-003**	**0.0601**	**0.0373**	**8.0000e-005**	**1.6800e-003**	**1.2000e-004**	**1.8000e-003**	**4.7000e-004**	**1.1000e-004**	**5.8000e-004**	**0.0000**	**7.7017**	**7.7017**	**1.1800e-003**	**0.0000**	**7.7311**

3.6 Paving - 2019

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	0.0114	0.1148	0.1108	1.7000e-004		6.4800e-003	6.4800e-003		5.9700e-003	5.9700e-003	0.0000	15.0501	15.0501	4.6300e-003	0.0000	15.1658
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0114**	**0.1148**	**0.1108**	**1.7000e-004**		**6.4800e-003**	**6.4800e-003**		**5.9700e-003**	**5.9700e-003**	**0.0000**	**15.0501**	**15.0501**	**4.6300e-003**	**0.0000**	**15.1658**

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	2.2000e-004	9.0000e-005	1.2700e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0967	0.0967	1.0000e-005	0.0000	0.0969
Total	**2.2000e-004**	**9.0000e-005**	**1.2700e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0967**	**0.0967**	**1.0000e-005**	**0.0000**	**0.0969**

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	3.4100e-003	0.0756	0.1260	1.7000e-004		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004	0.0000	15.0501	15.0501	4.6300e-003	0.0000	15.1658
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.4100e-003**	**0.0756**	**0.1260**	**1.7000e-004**		**4.6000e-004**	**4.6000e-004**		**4.6000e-004**	**4.6000e-004**	**0.0000**	**15.0501**	**15.0501**	**4.6300e-003**	**0.0000**	**15.1658**

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	2.2000e-004	9.0000e-005	1.2700e-003	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0967	0.0967	1.0000e-005	0.0000	0.0969
Total	**2.2000e-004**	**9.0000e-005**	**1.2700e-003**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0967**	**0.0967**	**1.0000e-005**	**0.0000**	**0.0969**

3.7 Architectural Coating - 2019

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	1.1241					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4000e-003	0.0165	0.0166	3.0000e-005		1.1600e-003	1.1600e-003		1.1600e-003	1.1600e-003	0.0000	2.2979	2.2979	1.9000e-004	0.0000	2.3028
Total	**1.1265**	**0.0165**	**0.0166**	**3.0000e-005**		**1.1600e-003**	**1.1600e-003**		**1.1600e-003**	**1.1600e-003**	**0.0000**	**2.2979**	**2.2979**	**1.9000e-004**	**0.0000**	**2.3028**

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	3.4000e-004	1.5000e-004	1.9700e-003	0.0000	1.0000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1499	0.1499	1.0000e-005	0.0000	0.1502
Total	**3.4000e-004**	**1.5000e-004**	**1.9700e-003**	**0.0000**	**1.0000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1499**	**0.1499**	**1.0000e-005**	**0.0000**	**0.1502**

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	1.1241					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9000e-004	9.5400e-003	0.0165	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.2979	2.2979	1.9000e-004	0.0000	2.3028
Total	**1.1246**	**9.5400e-003**	**0.0165**	**3.0000e-005**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**2.2979**	**2.2979**	**1.9000e-004**	**0.0000**	**2.3028**

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	3.4000e-004	1.5000e-004	1.9700e-003	0.0000	1.0000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1499	0.1499	1.0000e-005	0.0000	0.1502
Total	**3.4000e-004**	**1.5000e-004**	**1.9700e-003**	**0.0000**	**1.0000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1499**	**0.1499**	**1.0000e-005**	**0.0000**	**0.1502**