RIVERBEND RESIDENTIAL DEVELOPMENT AIR QUALITY & GREENHOUSE GAS EMISSIONS ASSESSMENT

Petaluma, California

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Introduction

The purpose of this report is to address air quality, toxic air contaminant (TAC), and greenhouse gas (GHG) emission impacts associated with the proposed single-family development at 529 Madison Street in Petaluma, California. The proposed project would construct 29 single-family homes. The existing site is currently undeveloped. The air quality impacts and GHG emissions would be associated with the construction of the new building and infrastructure, and operation of the project. Air pollutant and GHG emissions associated with the construction and operation of the project were predicted using models. In addition, the potential construction health risk impact to nearby sensitive receptors and the impact of existing toxic air contaminant (TAC) sources affecting the proposed residences were evaluated. This analysis addresses those issues following the guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Setting

The project is located in the portion of Sonoma County within 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

Toxic air contaminants (TAC) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically

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

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.

Odors

Odor impacts are subjective in nature and are generally regarded as an annoyance rather than a health hazard. The ability to detect and react to odors varies considerably among people. A strong or unfamiliar odor is more easily detected and are more likely to cause complaints. BAAQMD responds to odor complaints from the public and considers a source to have a substantial number of odor complaints if the complaint history includes five or more confirmed complaints per year averaged over a 3-year period. Facilities that are regulated by CalRecycle (e.g. landfill, composting, etc.) are required to have *Odor Impact Minimization Plans* in place.

Regulatory Agencies

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. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations. In 2008, CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles.[2] The regulation requires affected vehicles to meet specific performance requirements between 2014 and 2023, with all affected diesel vehicles required to have 2010 model-year engines or equivalent by 2023. These requirements are phased in over the compliance period and depend on the model year of the vehicle.

The BAAQMD is the regional agency tasked with managing air quality in the region. At the State level, the CARB (a part of the California Environmental Protection Agency [EPA]) oversees regional air district activities and regulates air quality at the State level. The BAAQMD has published California Environmental Quality Act (CEQA) Air Quality Guidelines that are used in this assessment to evaluate air quality impacts of projects.[3] The detailed community risk modeling methodology used in this assessment is contained in *Attachment 1*.

[2] Available online: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed: November 21, 2014.
[3] Bay Area Air Quality Management District. 2017. *BAAQMD CEQA Air Quality Guidelines*. May.

Regulatory Setting

Federal Regulations

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

In the past decade the EPA has established a number of emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of NO_X and particulate matter (PM_{10} and $PM_{2.5}$) and because the EPA has identified DPM as a probable carcinogen. Implementation of the heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce particulate matter and NO_X emissions from diesel engines up to 95 percent in 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards.[4]

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

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

State Regulations

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.[5] 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

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

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

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

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

Bay Area Air Quality Management District (BAAQMD)

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

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

The BAAQMD California Environmental Quality Act (*CEQA) Air Quality Guidelines*[6] 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.

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

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 14, 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. The closest sensitive receptors are residences across Madison Street. There are other residences located further from the project site to the east, west, and north. The project would include new sensitive receptors in the form of residences.

Significance Thresholds

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

Table 1. Community Risk Significance and GHG Thresholds

Criteria Air Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	**Average Daily Emissions (lbs./day)**	**Annual Average Emissions (tons/year)**
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour avg) or 20.0 ppm (1-hour avg)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1,000-foot zone of influence)**	
Excess Cancer Risk	>10.0 per one million	>100 per one million	
Hazard Index	>1.0	>10.0	
Incremental annual $PM_{2.5}$	>0.3 µg/m^3	>0.8 µg/m^3	
Odor			
5 confirmed complaints per year averaged over 3 years			
Greenhouse Gas Emissions			
Land Use Projects – direct and indirect emissions	Compliance with a Qualified GHG Reduction Strategy OR 1,100 metric tons annually or 4.6 metric tons per capita (for 2020) 660 metric tons annually or 2.8 metric tons per capita (for 2030)*		

Note: ROG = reactive organic gases, NOx = nitrogen oxides, PM_{10} = course particulate matter or particulates with an aerodynamic diameter of 10 micrometers (µm) or less, $PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5µm or less. GHG = greenhouse gases.*BAAQMD does not have a recommended post-2020 GHG threshold.

Air Quality Impacts and Mitigation Measures

Impact 1: Conflict with or obstruct implementation of the applicable air quality plan? ***Less than significant.***

The most recent clean air plan is the *Bay Area 2010 Clean Air Plan* that was adopted by BAAQMD in September 2010. The proposed project would not conflict with the latest Clean Air planning efforts since, 1) the project would have emissions well below the BAAQMD criteria pollutant thresholds (see Impact 2), 2) development would be near existing and future transit with regional connections, and 3) would be considered urban infill. The project, at 30 dwelling units is too small to exceed any of the criteria pollutant significance thresholds and, thus, it is not required to incorporate project-specific transportation control measures listed in the latest Clean Air Plan.

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***

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 2016.3.2 was used to estimate emissions from construction and operation of the site assuming full build-out of the project. The project land use types and size, and anticipated construction schedule were input to CalEEMod. The model output from CalEEMod is included as *Attachment 2*.

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 phasing schedule, was developed based on information provided by the project applicant. The proposed project land uses were input into CalEEMod, which included 30 dwelling units entered as "Single Family Housing" on a 4-acre site. It was estimated that the project would require up to 2,600 cubic yards (cy) of soil import. Eleven anticipated cement truck trips were entered into the model and 315-cy of asphalt would be hauled during paving.

Construction was assumed to begin July 2019 and the primary activities that generate emissions were modeled to last 11 months. There were an estimated 243 construction workdays. Average daily emissions were computed 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, predicted the construction period emissions would not exceed the BAAQMD significance thresholds.

Table 2. Construction Period Emissions

Scenario	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Total construction emissions (tons)	0.4 tons	0.5 tons	0.02 tons	0.02 tons
Average daily emissions (pounds)[1]	3.5 lbs.	3.8 lbs.	0.2 lbs.	0.2 lbs.
BAAQMD Thresholds (pounds per day)	*54* lbs.	*54* lbs.	*82* lbs.	*54* lbs.
Exceed Threshold?	**No**	**No**	**No**	**No**
Notes: [1]Assumes 243 workdays.				

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

Mitigation Measure AQ-1: **Include 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.

Operational Period Emissions

Due to the project size, operational-period emissions would be less than significant. In the 2011 update to the CEQA Air Quality Guidelines, BAAQMD identifies screening criteria for the sizes of land use projects that could result in significant air pollutant emissions. For operational impacts, the screening project size is identified at 325 dwelling units. Single-family housing projects of smaller size would be expected to have less-than-significant impacts with respect to operational-period emissions. Since the project proposes to develop 29 dwelling units, it is concluded that emissions would be below the BAAQMD significance thresholds for the operational period. Stationary sources of air pollution (e.g., back-up generators) have not been identified with this project.

Impact 3: Expose sensitive receptors to substantial pollutant concentrations?
Less-than-significant with 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 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. Operation of the project is not expected to cause any localized emissions that could expose sensitive receptors to unhealthy air pollutant levels. No stationary sources of TACs, such as generators, are proposed as part of the project.

The project would include new sensitive receptors in the form of residences. Substantial sources of air pollution can adversely affect sensitive receptors proposed as part of new projects. A review of the area indicates that Lakeville Street, future SMART rail, and three stationary sources of TACs are

within 1,000 feet of the site and can adversely affect new residences. There are thresholds that address both the impact of single and cumulative TAC sources upon projects that include new sensitive receptors (see Table 1). Construction activity would generate dust and equipment exhaust on a temporary basis that could affect nearby sensitive receptors that include residences.

Operational Community Health Risk Impacts – New Project Residents

Traffic on high volume roadways is a source of TAC emissions that may adversely affect sensitive receptors in close proximity to the roadway. For roadways, BAAQMD has published a screening calculator to determine if roadways with traffic volumes of over 10,000 vehicles per day may have a significant effect on a proposed project. Based on Google Earth Pro volumes and assuming one percent growth per year, Lakeville Street will have an average daily traffic (ADT) volume of 7,189, which is below the BAAQMD screening size for potentially significant risk impacts.

Impacts from Stationary Sources

Permitted stationary sources of air pollution near the project site were identified using BAAQMD's *Stationary Source Risk & Hazard Analysis Tool*. This mapping tool uses Google Earth and identified the location of five possible stationary source and its estimated risk and hazard impacts. A Stationary Source Information Form (SSIF) containing the identified sources was prepared and submitted to BAAQMD. They provided updated risk levels, emissions and adjustments to account for new OEHHA guidance[7]. The District noted that one of stationary sources (Brusing Associates, Inc.) was inactive and they included an additional gas dispensing facility (Santa Rosa Grand Petroleum on 532 East Washington Street) for analysis. A total of five stationary sources were analyzed.

Hunt & Behrens, Inc (Plant #106418) and Santa Rosa Grand Petroleum, Inc (Plant #109754 and #111595) were identified as gas dispensing facilities. Clover Stornetta Farms Inc. (Plant #13322) was identified as a generator source. Another source at Hunt & Behrens, Inc (Plant #1889) was identified as having multiple sources, which required refined dispersion modeling. Excluding Plant #1889 (Hunt & Behrens, Inc.), the provided screening cancer, non-cancerous hazard, and $PM_{2.5}$ risks for all other stationary sources were adjusted for distance using one of the following distance multipliers when appropriate: Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities, Distance Adjustment Multiplier Tool for Diesel Backup Generator, or Distance Adjustment Multiplier Tool for Generic Case. The adjusted risk values are listed in Table 4.

Hunt and Behrens, Inc. (Plant #1889)

Hunt and Behrens, Inc., is a livestock feed and supply facility that offers commercial livestock and pet products. The facility is approximately 700 feet southeast of the project site. Using the BAAQMD *Risk and Hazards Emission Screening Calculator (Beta Version),* the unadjusted (i.e. does not take distance into account) risk values were as follows: the cancer risk was 0.12 per million, the chronic hazard index was <0.01, and the $PM_{2.5}$ concentration was 3.34 $\mu g/m^3$. The

[7] Correspondence with Areana Flores, BAAQMD, 10 April 2019.

$PM_{2.5}$ concentration exceeds the BAAQMD single-source threshold of greater than 0.3μg/$m^{3.}$ Therefore, a more refined analysis was conducted in consultation with BAAQMD.

To estimate the maximum $PM_{2.5}$ concentration, dispersion modeling was done using the U.S. EPA ISCST3 dispersion model. The modeling used a five-year data set (1990 - 1994) of hourly meteorological data from the Petaluma Airport that was prepared for use with the ISCST3 model by BAAQMD. Two area sources were used to model the $PM_{2.5}$ emissions with a release height of 3.1 meters (10 feet) to account for the equipment used by the facility (e.g. pellet machine, floor pit, grinder, grain pit, screw conveyor). Emissions from the facility were distributed throughout the modeled area sources as seen in Figure 1. The worst-case scenario was assumed that the facility would run 24 hours per day. The maximum-modeled annual $PM_{2.5}$ concentration from the mill facility emissions at the project site was 0.09 μg/$m^{3.}$ The health risk calculations and modeling results are in attachment 3.

Impacts from Clover Stornetta Farms Diesel Trucks

The Clover Stornetta Farms dairy processing plant on Madison Street is adjacent to the southern boundary of the Phase 1 project site. The location of the processing facility relative to the project site is shown in Figure 1. The dairy processing plant has about 60 truck trips per day, which include Stornetta Farms trucks, milk tankers, and other delivery trucks. Many of these trucks use diesel-fueled transport refrigeration units (TRUs). TRUs are trailer-mounted units, powered by small diesel-fueled engines, which provide chilled air to trailers carrying perishable goods (e.g., produce, meats, and dairy products). CARB has developed an Air Toxic Control Measure (ACTM) for In-Use Diesel-Fueled Transport Refrigeration Units (TRUs) and TRU Generator Sets, and Facilities Where TRUs Operate.[8] The primary control measure is a gradual phase-in of low- and ultra-low-emission standard TRUs beginning in 2008.

It was estimated that between 10 and 30 TRUs per day are at the Clover site and that the TRUs operate between 0 and 12 hours while on site depending on how long the trucks remain on site, the outside temperature, and other factors. The TRUs do not run continuously, they run long enough to cool the unit to target temperatures, and then they will shut off. The operational hours will vary from winter to summer, with longer hours of operation needed during the hot summer month and decreased or no running during colder winter months depending on the outside temperatures.[9]

To estimate emissions from TRU operation at the Stornetta facility, as a reasonable worst-case it was assumed that there are 30 TRU units operating daily for 7 hours per day based on correspondence with Clover Stornetta management. The TRUs were assumed, on average, to have 29.5 horsepower diesel-fueled engines and operate at a load factor of 0.46, consistent with CARB guidance. Since the specific locations where the TRUs would be operating would vary over time, the TRU emissions were distributed over the possible locations at the facility where emissions could occur and modeled as 51-point sources. The locations of these emission points are shown in Figure 1.

[8] California Air Resources Board. Available: http://www.arb.ca.gov/diesel/tru/tru.htm.
[9] Correspondence between Joshua Carman, Illingworth & Rodkin, and Michael Benedetti of Clover Stornetta Farms, November 25 and December 4, 2015.

In addition to DPM emissions from the TRUs at the Clover facility, there would also be DPM emissions from truck travel and truck idling while at the site. To estimate emissions from on-site truck travel it was assumed that the trucks would travel around a 1,050-foot loop at the facility at a speed of 5 mph. It was conservatively assumed that 60 trucks per day would access the site and that all trucks would be heavy-duty diesel trucks. Truck travel exhaust emissions were calculated using emission factors from the CARB EMFAC2014 emissions model for heavy heavy-duty diesel trucks at a speed of 5 mph. For emissions during truck idling, it was assumed that each truck visiting the site would idle for up to 5 minutes per truck. CARB emission factors for heavy heavy-duty diesel truck idling were used to calculate the emissions.

DPM concentrations at the locations of the proposed project's residential units were calculated using the U.S. EPA ISCST3 dispersion model[10]. The modeling used a five-year data set (1990 - 1994) of hourly meteorological data from the Petaluma Airport that was prepared for use with the ISCST3 model by BAAQMD. As described above, DPM emissions from the TRUs were modeled as a series of 51-point sources located throughout the Clover facility. Emissions from truck idling were also modeled as point sources at the same locations as those used for the TRUs. On-site truck travel emissions were modeled as a line-volume source (a series of adjacent volume sources located along the truck travel path). The locations of the point sources for the TRUs and truck idling and the line-volume source for truck travel emissions are shown in Figure 1. Details of the emission calculations and source parameters used in the modeling are provided in *Attachment 3*.

Predicted Cancer Risk and Hazards

The maximum modeled DPM concentrations from trucking activities at the Clover facility occurred at a residential unit in the southeast portion of the Phase 1 development area, as shown on Figure 1. Increased cancer risks were calculated using the modeled DPM concentrations and OEHHA and BAAQMD recommended risk assessment methods previously described. Results of this assessment indicate that the maximum increased residential cancer risk would be 20.1 in one million. This maximum residential excess cancer risk would be greater than the BAAQMD significance threshold of 10 in one million and would be considered a *significant impact*. The location where the maximum increased cancer risk would occur is shown on Figure 1. Figure 2 shows the increased cancer risk at each on-site project receptor location.

The maximum-modeled annual $PM_{2.5}$ concentration from trucking activity emissions, was <0.1 $\mu g/m^3$, occurring at the same location where the maximum increased cancer risk from would occur. This maximum annual $PM_{2.5}$ concentration would not exceed the BAAQMD significance threshold of 0.3 $\mu g/m^3$ and would be considered a *less than significant impact.*

The maximum modeled annual residential DPM concentration was 0.034 $\mu g/m^3$. The maximum computed HI based on this DPM concentration is 0.01, which is much lower than the BAAQMD

[10] Note that U.S. EPA's AERMOD model is the dispersion model preferred by BAAQMD for air quality modeling purposes. However, representative meteorological data suitable for AERMOD is not available. On the other hand, ISCST3 is valid regulatory approved model that BAAQMD recommends in the absence of suitable meteorological data for AERMOD. ISCST3 is the predecessor model to AERMOD.

significance criterion of a HI greater than 1.0 and would be considered a *less than significant impact.*

> ***Mitigation Measure AQ-2:*** **Include high-efficiency particulate filtration systems in residential ventilation systems.**

The project shall include the following measures to minimize long-term annual DPM exposure for new project occupants that are located within 100 feet of the Clover Stornetta site:

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

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

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

Effectiveness: A system with MERV13 would achieve an 80-percent reduction[11]. Increased cancer risk and $PM_{2.5}$ exposures for MERV13 filtration cases were calculated assuming a combination of outdoor and indoor exposure. For use of MERV13 filtration systems, without the additional use of sealed, inoperable widows and no balconies, an outdoor exposure of three hours to ambient DPM concentrations and 21 hours of indoor exposure to filtered air was assumed. In this case, the effective control efficiency using a MERV13 filtration system is about 70 percent for DPM and other particulate matter exposure. This would reduce the cancer risk at the Project Site to well below the threshold of 10 chances per million.

Impacts from SMART

The project would be located adjacent to a rail line which does not currently include freight trains. The planned and approved Sonoma-Marin Area Rail Transit (SMART) trains would use this rail line and, in addition, the North Coast Railroad Authority (NCRA) has proposed to begin freight service as a shared corridor between Highway 37 and Cloverdale. The SMART trains would be modern diesel-powered trains, which are expected to have relatively low emissions, and NCRA freight engines are proposed to meet U.S. EPA Tier 3 standards. The SMART Draft Environmental Impact Report (DEIR) predicted $PM_{2.5}$ concentrations of well below 0.1 $\mu g/m^3$ at

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

a distance of 30 feet or more from the tracks.[12] According to the SMART Draft Supplemental Environmental Impact Report (SEIR),[13] assuming a scenario of weekend SMART service, excess cancer risk from the shared passenger and freight corridor would be 9.2 in one million at a distance of 30 feet or more from the tracks, which is below the BAAQMD threshold of significance. Therefore, emissions of diesel exhaust from train passages near the site are not expected to cause significant risk exposures to future project residents.

Combined Community Risk Impacts at Project Site

As discussed above, the project site is affected by multiple sources of TACs. Table 4 shows the cancer risk associated with each source affecting the project site. With the exception of the Clover Stornetta truck impact, all other sources of TACs were below the BAAMQD single-source thresholds for cancer risk, non-cancerous risk (hazard index), and annual $PM_{2.5}$ concentration. However, with *Mitigation Measure AQ-2*, the cancer risk impacts from the Clover would not exceed the single-source threshold of greater than 10.0 per million. The combined total of all impacts from all sources (i.e., sources within 1,000 feet of the project) would be below the BAAQMD thresholds. Therefore, the combined impact from operational community risk at the project site would be considered *less-than-significant*.

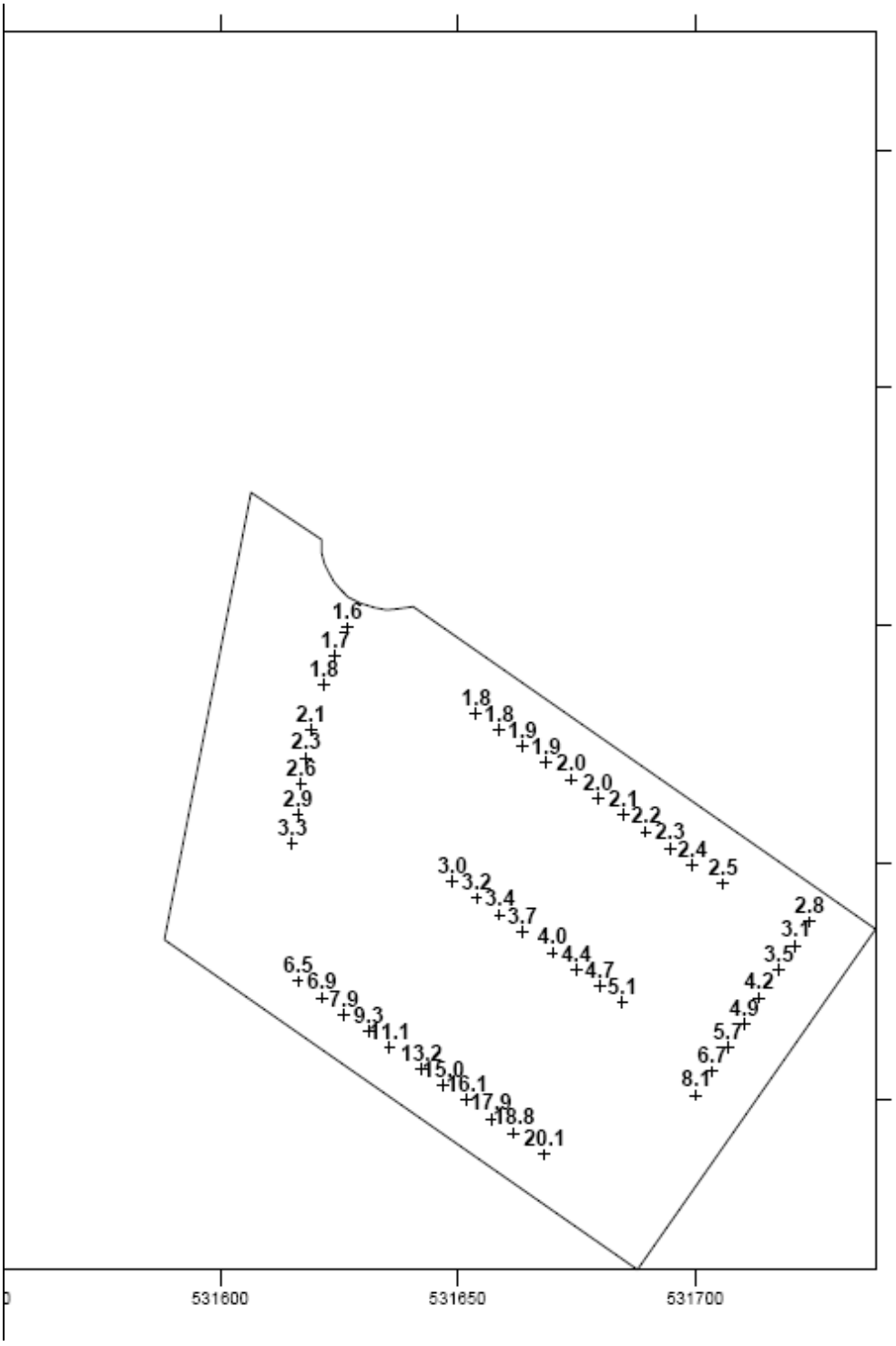
Table 4. Impacts from Combined Sources at Project Site

Source	Maximum Cancer Risk (per million)	Hazard Index	$PM_{2.5}$ concentration ($\mu g/m^3$)
Clover Stornetta Farms Inc (Plant #13322, generator) at 200-ft	3.8	<0.01	<0.01
Clover Stornetta Truck Impacts			
Unmitigated	**20.1**	0.01	<0.1
Mitigated	6.0 to 9.7	<0.01	<0.1
Hunt and Behrens, Inc (Plant #106418, gas dispensing facility) at 700-ft	0.1	<0.01	-
Hunt and Behrens, Inc (Plant #1889, multiple sources) at 700-ft	<0.1	<0.01	0.09
Santa Rosa Grand Petroleum, Inc (Plant #109754, gas dispensing facility) at 900-ft	0.26	<0.01	-
Santa Rosa Grand Petroleum, Inc (Plant #111595, gas dispensing facility) at 1,000-ft		<0.01	-
SMART and NCRA shared corridor	9.2	<0.02	<0.1
BAAQMD Single-Source Threshold	***>10.0***	***>0.3***	***>1.0***
Significant	No	No	No
Combined Total	34.4	<0.06	<0.2
BAAQMD Thresholds	***100***	***10.0***	***0.8***
Significant?	***No***	***No***	***No***

[12] Sonoma-Marin Area Rail Transit DEIR, November 2005.
[13] Sonoma-Marin Area Rail Transit SEIR, March 2008.

Figure 1. **Project Site and On-Site Receptors, Clover Stornetta Farms Modeled Truck Emissions Sources, Hunt & Behrens Emission Sources, and On-Site Project Receptor with Maximum TAC Impacts**

Figure 2. Project Site and Increased Cancer Risks (per million) from Clover Stornetta Farms Truck Activities



Construction Community Health Risk Impacts – Offsite Sensitive Receptors

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust air pollutant emissions would not be considered to contribute substantially to existing or projected air quality violations. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary community risk impact issue associated with construction emissions are cancer risk and exposure to $PM_{2.5}$. Diesel exhaust poses both a potential health and nuisance impact to nearby receptors. A health risk assessment of the project construction activities was conducted that evaluated potential health effects to nearby sensitive receptors from construction emissions of DPM and $PM_{2.5}$.[14] This assessment included dispersion modeling to predict the offsite and onsite concentrations resulting from project construction, so that lifetime cancer risks and non-cancer health effects could be evaluated.

Construction Emissions

The CalEEMod model provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total emissions from all construction stages as 0.0198 tons (39.6 pounds). The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. A trip length of one mile was used to represent vehicle travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod as 0.0139 tons (27.7 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA ISCST3 dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ at existing sensitive receptors in the vicinity of the project construction site. The ISCST3 dispersion model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.[15,16] Emission sources for the construction site were grouped into two categories, exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions. Two area sources were used in the dispersion modeling of project emissions. One of the area sources was used for DPM exhaust emissions and the other three area sources was used for fugitive $PM_{2.5}$ dust emissions. For the exhaust emissions from construction equipment, an emission release height of six meters (19.7 feet) was used for the area source. 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 source. Emissions from vehicle travel around the project site were

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

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

[16] Note that U.S. EPA's AERMOD model is the dispersion model preferred by BAAQMD for air quality modeling purposes. However, representative meteorological data suitable for AERMOD is not available. On the other hand, ISCST3 is valid regulatory approved model that BAAQMD recommends in the absence of suitable meteorological data for AERMOD. ISCST3 is the predecessor model to AERMOD.

included in the modeled area sources. Construction emissions were modeled as occurring daily from 7 a.m. to 4 p.m.

The modeling used a five-year data set (1990 - 1994) of hourly meteorological data from the Petaluma Airport that was prepared for use with the ISCST3 model by the BAAQMD. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2019 - 2020 construction period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby sensitive receptors using receptor heights of 1.5 meters (4.9 feet) to represent the breathing heights of residents.

Predicted Cancer Risk and Hazards

The maximum modeled DPM and $PM_{2.5}$ concentrations occurred at a residence Madison Street across from the Phase 1 construction area, as shown on Figure 3. Increased cancer risks were calculated using the modeled DPM concentrations and OEHHA and BAAQMD recommended risk assessment methods previously described. Due to the short-anticipated duration of project construction activities (about 17 months), infant exposures were assumed in calculating cancer risks for residential exposures. Because an infant (0 to 2 years of age) has a breathing rate that is greater than the breathing rate for the 3rd trimester the contribution to total cancer risk from an infant exposure is greater than if the initial exposure assumed for the 3rd trimester is assumed. It was conservatively assumed that an infant exposure to construction emissions would occur over the entire construction period. Details of the construction health risk modeling and evaluation are provided in *Attachment 4*.

Cancer Risk

Results of this assessment indicate that the maximum increased residential cancer risks would be 7.7 in one million for an infant exposure and 0.2 in one million for an adult exposure. The maximum residential excess cancer risk would be below the BAAQMD significance threshold of 10 in one million.

Predicted Annual $PM_{2.5}$ Concentration

The maximum-modeled annual $PM_{2.5}$ concentration, which is based on combined exhaust and fugitive dust emissions, was 0.1 $\mu g/m^3$, occurring at the same residence where the maximum increased cancer risk from construction would occur. The maximum annual $PM_{2.5}$ concentration from construction activities would not exceed the BAAQMD significance threshold of 0.3 $\mu g/m^3$.

Non-Cancer Hazards

The maximum modeled annual residential DPM concentration (i.e., from construction exhaust) was 0.01 $\mu g/m^3$. The maximum computed HI based on this DPM concentration is 0.02, which is much lower than the BAAQMD significance criterion of a HI greater than 1.0.

Figure 3. Project Construction Site and Locations of Sensitive Receptors and Maximum TAC Impact

Combined Construction Risk Assessment

Table 5 reports both the project and cumulative community risk impacts at the sensitive receptor most affected by construction (i.e. the construction MEI). Without mitigation, the project would have a *less-than-significant* impact with respect to community risk caused by project construction activities, since the maximum cancer risk and $PM_{2.5}$ concentration do exceed their single-source thresholds. Additionally, the combined annual cancer risk, $PM_{2.5}$ concentration, and Hazard risk values, which includes unmitigated and mitigated, would not exceed the cumulative threshold. Therefore, the project would also have a *less-than-significant* impact regarding the cumulative risk within the area.

Table 5. Combined Cancer Risks, $PM_{2.5}$ Concentrations, and Hazard Index at Construction MEI

Source	Cancer Risk (per million)	Acute and Chronic Hazard (HI)	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Proposed Project Construction	7.7	0.01	0.1
BAAQMD Single-Source Threshold	***>10.0***	***>1.0***	***>0.3***
Significant?	*No*	*No*	*No*
Clover Stornetta Farms Inc (Plant #13322) at 430-ft	1.4	<0.01	<0.01
Clover Stornetta Truck Impacts	<20.1	<0.01	<0.1
Hunt and Behrens, Inc (Plant #106418, gas dispensing facility) at 1,000-ft	0.2	<0.01	-
Hunt and Behrens, Inc (Plant #1889) at >1,000-ft	<1.0	<0.01	0.06
Santa Rosa Grand Petroleum, Inc (Plant #109754) at 850-ft	0.3	<0.01	-
Santa Rosa Grand Petroleum, Inc (Plant #111595) at 1,000-ft	0.6	<0.01	-
SMART and NCRA shared corridor	<9.2	<0.02	<0.1
Combined Total	<40.5	<0.08	<0.27
BAAQMD Cumulative Source Threshold	***>100***	***>10.0***	***>0.8***
Significant?	*No*	*No*	*No*

Impact 4: Result in other emissions (such as those leading to odors) adversely 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*

The project site is adjacent to Clover Stornetta, which processes and produces dairy products. The BAAQMD CEQA Air Quality Guidelines, Table 3-3, provides odor screening distances rounded to miles. These screening distances indicate the maximum distance that a source category could have related to significant odor complaints. BAAQMD recommends that the

screening distances should be used as information to consider along with other information pertaining to odors and complaint history and not be used as the criteria. The Clover Stornetta facility may fall under the *Food Processing Facility* type of operation, which has an odor screening distance of one mile. However, this source type is mostly representative of restaurants with that include char broilers, deep-fryers, and ovens tend to produce food odors that can be considered offensive to some people. In addition, facilities that produce food waste that is not properly managed can result in odor complaints. The potential for odors is addressed by considering the types of facility operations, history of the existing facility with respect to causing odor complaints, the location of the new residences with respect to the facility and examining the wind patterns.

Since the Clover Stornetta facility processes food, there is the potential to produce odors associated with the storage and processing of dairy products. Project residences could be 100 feet or further away to the north. I&R inquired with the Clover Stornetta and found they were not aware of any odors complaints or related issues over the last 2 to 3 years[17]. Clover stated that they operate a small wastewater treatment plant on site to process wastewater prior to releasing it to the City's sewer. They noted that the dairy waste solids are captured prior and transferred from a holding tank to a transport tanker and hauled to the City's water treatment plant. There is a strong detectable smell that is present during these transfers. The transfers occur about once per day and typically at night to avoid any detection by nearby neighbors. However, these transfers sometimes occur during the daytime. This activity is about 500 feet from the project.

I&R staff has made several visits to the site and is familiar with the surrounding area. Noticeable odors were not noticed on any of those visits. A public records request was made to the BAAQMD on December 4, 2019 to obtain any record of odor complaints from the facility, listed by BAAQMD as Plant No. 133222, Clover Stornetta Farms Inc at 91 Lakeville Street[18]. The District responded that no such records found, which was interpreted as no odor complaints have been received by the District that were assigned to that facility. There are residences located about 100 feet southeast and east of the facility and about 400 to 500 feet to the northeast and north.

The dominant wind flow in the area is from the west-northwest to the east-southeast, where new residences would be located to the north-northeast. Wind flow from the southwest, which would put the new residences downwind is not that common and occurs less than 20 percent of the time. The residences to the east and southeast are typically downwind of the facility.

BAAQMD considers a substantial number of odor complaints, specifically, more than five confirmed complaints per year averaged over the past three years as the indication of an odor impact. As described above, BAAQMD nor the Clover Stornetta have received odor complaints from the facility. However, because this is an existing environment, impacts to new project residents are noted but not assessed.

[17] Email between Michael Benedetti of Clover Stornetta and James Reyff of Illingworth & Rodkin, Inc. on January 7, 2020.
[18] BAAQMD Public Records Request Number 2019-12-0048, Public Record Status: Closed - No Records Found

Greenhouse Gas Emissions and Mitigation Measures

Setting

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

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

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

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

Recent Regulatory Actions

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

AB 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions target by directing CARB to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, CEC, California Public Utilities Commission (CPUC), and Building

Standards Commission have all been developing regulations that will help meet the goals of AB 32 and Executive Order S-3-05.

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

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

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

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

SB 350 Renewable Portfolio Standards

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

Executive Order EO-B-30-15 (2015) and SB 32 GHG Reduction Targets

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

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

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

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

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

BAAQMD Significance Thresholds

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

Although BAAQMD has not published a quantified threshold for 2030 yet, this assessment uses a "Substantial Progress" efficiency metric of 2.6 MT CO_2e/year/service population and a bright-line threshold of 660 MT CO_{2e}/year based on the GHG reduction goals of EO B-30-15. The service population metric of 2.8 is calculated for 2030 based on the 1990 inventory and the projected 2030 statewide population and employment levels.[15] The 2030 bright-line threshold is a 40 percent reduction of the 2020 1,100 MT CO_{2e}/year threshold.

Impact 1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? ***Less than significant.***

Due to the project size, operational GHG emissions would also be less than significant. The Operational GHG screening size for single-family homes is 56 dwelling units. The proposed project includes 29 single-family. The GHG emissions then would be below the BAAQMD significance threshold for GHG in 2020. Alternatively, if the project were to start operation beyond 2020, then it is assumed that GHG emissions would remain less-than-significant since emissions decrease over time due to improvements in vehicle emissions and use of cleaner energy.

Impact 2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? ***Less than significant.***

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. The project would also be subject to local policies that may affect emissions of greenhouse gases.

[15] Association of Environmental Professionals, 2016. *Beyond 2020 and Newhall: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California*. April.

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.[16] 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.[17] This HRA used the 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.[18] 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 and duration of exposure. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

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

[16] 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.
[17] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[18] BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

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

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) 80th Percentile Rate		273	758	631	572	261
Daily Breathing Rate (L/kg-day) 95th Percentile Rate		361	1,090	861	745	335
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

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: Provided Construction Schedule and CalEEMod Model Outputs

Project Name: Phase 1

Complete ALL Portions in Yellow

See Equipment Type TAB for type, horsepower and load factor

Project Size 32 single family 4 acres

Construction Hours am to pm

Qty	Description	HP	Load Factor	Hours/day	Total Work Days	Avg. Hours per day	Annual Hours	Comments
	Demolition	**Start Date:**	***7/1/2016***	**Total work days:**	5			**Overall Import/Export Volumes**
		End Date:	7/8/2016					
1	Concrete/Industrial Saws	81	0.73	6	1	1.20	6	**Demolition Volume**
1	Excavators	162	0.3819	4	3.5	2.80	14	Square footage of buildings to be demolished
1	Rubber-Tired Dozers	255	0.3953	6	4	4.80	24	
	Other Equipment?							0 square feet
	Site Preperation	**Start Date:**	**7/11/2015**	**Total work days:**	2			Any pavement demolished and hauled 0 tons
		End Date:	7/13/2015					
1	Rubber Tired Dozers	255	0.3953	7	2	7.00	14	
1	Tractors/Loaders/Backhoes	97	0.3685	7	2	7.00	14	
	Other Equipment?							
	Grading / Excavation	**Start Date:**	**7/13/2015**	**Total work days:**	8			
		End Date:	7/22/2015					**Soil Hauling Volume**
2	Excavators	162	0.3819	7	2	1.75	28	Export volume = **0** cubic yards
1	Graders	174	0.4087	7	2	1.75	14	Import volume = **2,600** cubic yards
1	Rubber Tired Dozers	255	0.3953	6	8	6.00	48	
2	Scrapers	361	0.48	6	6	4.50	72	
2	Tractors/Loaders/Backhoes							
	Trenching	**Start Date:**		**Total work days:**	5			
		End Date:						
1	Tractor/Loader/Backhoe	97	0.3685	8	5	8.00	40	
1	Excavators	162	0.3819	6	5	6.00	30	
	Other Equipment?							
	Building - Exterior	**Start Date:**		**Total work days:**	200			**Cement Trucks 11 Total Round-Trips**
		End Date:						
1	Cranes	226	0.2881	0	0	0.00	0	Electric? (Y/N) ___ Otherwise assumed diesel
1	Forklifts	89	0.201	2	200	2.00	400	Liquid Propane (LPG)? (Y/N) ___ Otherwise Assumed diesel
1	Generator Sets	84	0.74	8	45	1.80	360	Or temporary line power? (Y/N) ___
1	Tractors/Loaders/Backhoes	97	0.3685	2	200	2.00	400	
1	Welders	46	0.45	0	0	0.00	0	
	Other Equipment?							
Building - Interior/Architectural Coating		**Start Date:**		**Total work days:**	20			
		End Date:						
1	Air Compressors	78	0.48	7	20	7.00	140	
1	Aerial Lift	62	0.3	2	20	2.00	40	
	Other Equipment?							
	Paving	**Start Date:**		**Total work days:**	2			
		Start Date:						

1	Cement and Mortar Mixers	9	0.56	0	0	0.00	0		
1	Pavers	125	0.4154	0	0	0.00	0	**Asphalt 315 cubic yards**	
1	Paving Equipment	130	0.3551	8	2	8.00	16		
1	Rollers	80	0.3752	8	2	8.00	16		
2	Tractors/Loaders/Backhoes	97	0.3685	8	2	8.00	32		
	Other Equipment?								

River Bend - Phase 1 Construction - Sonoma-San Francisco County, Annual

River Bend - Phase 1 Construction

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	29.00	Dwelling Unit	4.00	52,200.00	83

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**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

Land Use - Unit count and lot acreage from updated plans

Construction Phase - Anticipated schedule provided by applicant adjusted to 2019 start

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Trips and VMT - Bldg: 22 one-way cement truck trips. Paving: 315 cy asphalt @16cy/truck = 40 trips.

Grading - 2,600 cy soil import

Architectural Coating -

Vehicle Trips -

Woodstoves - no wood burning nat gas = 21

Water And Wastewater - wtp treatment

Construction Off-road Equipment Mitigation - Tier 2 engines, Tier 4 portable (aerial lifts, air compressors, saws, forklifts, generators). BAAQMD BMPs.

Energy Use -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Parking	150	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	18.00	20.00
tblConstructionPhase	NumDays	230.00	200.00
tblConstructionPhase	NumDays	20.00	6.00
tblConstructionPhase	NumDays	18.00	2.00
tblConstructionPhase	NumDays	5.00	2.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	7.50	21.00
tblFireplaces	NumberWood	12.90	0.00
tblGrading	MaterialImported	0.00	2,600.00
tblLandUse	LotAcreage	9.42	4.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	187.00	174.00

tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	367.00	361.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Trenching
tblOffRoadEquipment	PhaseName		Trenching
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.80
tblOffRoadEquipment	UsageHours	8.00	1.80

tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.80
tblOffRoadEquipment	UsageHours	8.00	1.80
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.80
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripNumber	0.00	22.00
tblTripsAndVMT	HaulingTripNumber	0.00	40.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	956.80	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					
2019	0.0304	0.3262	0.2468	5.4000e-004	0.0382	0.0137	0.0519	0.0160	0.0129	0.0288	0.0000	49.5782	49.5782	8.0700e-003	0.0000	49.7799
2020	0.3953	0.1296	0.1345	2.7000e-004	5.5400e-003	6.6100e-003	0.0121	1.5000e-003	6.3500e-003	7.8400e-003	0.0000	24.1752	24.1752	3.0100e-003	0.0000	24.2505

Maximum	**0.3953**	**0.3262**	**0.2468**	**5.4000e-004**	**0.0382**	**0.0137**	**0.0519**	**0.0160**	**0.0129**	**0.0288**	**0.0000**	**49.5782**	**49.5782**	**8.0700e-003**	**0.0000**	**49.7799**

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					
2019	0.0131	0.2279	0.2361	5.4000e-004	0.0224	1.7400e-003	0.0241	5.5800e-003	1.7100e-003	7.2900e-003	0.0000	49.5782	49.5782	8.0700e-003	0.0000	49.7799
2020	0.3872	0.1109	0.1398	2.7000e-004	5.5400e-003	1.0400e-003	6.5800e-003	1.5000e-003	1.0300e-003	2.5300e-003	0.0000	24.1752	24.1752	3.0100e-003	0.0000	24.2505
Maximum	**0.3872**	**0.2279**	**0.2361**	**5.4000e-004**	**0.0224**	**1.7400e-003**	**0.0241**	**5.5800e-003**	**1.7100e-003**	**7.2900e-003**	**0.0000**	**49.5782**	**49.5782**	**8.0700e-003**	**0.0000**	**49.7799**

	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	**5.96**	**25.67**	**1.40**	**0.00**	**36.18**	**86.31**	**52.08**	**59.52**	**85.73**	**73.23**	**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)
2	**6-27-2019**	**9-26-2019**	0.2655	0.1717
3	**9-27-2019**	**12-26-2019**	0.0829	0.0631
4	**12-27-2019**	**3-26-2020**	0.0757	0.0615
5	**3-27-2020**	**6-26-2020**	0.4491	0.4362
		Highest	0.4491	0.4362

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	0.2487	4.7600e-003	0.2170	3.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	2.9734	2.9734	3.9000e-004	5.0000e-005	2.9975
Energy	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	75.8429	75.8429	3.9500e-003	1.4600e-003	76.3776
Mobile	0.1015	0.4987	1.1284	3.0700e-003	0.2349	4.1400e-003	0.2390	0.0632	3.9100e-003	0.0671	0.0000	281.8483	281.8483	0.0132	0.0000	282.1791
Waste						0.0000	0.0000		0.0000	0.0000	7.3320	0.0000	7.3320	0.4333	0.0000	18.1648
Water						0.0000	0.0000		0.0000	0.0000	0.6916	1.9586	2.6501	2.5800e-003	1.5400e-003	3.1748
Total	**0.3547**	**0.5423**	**1.3620**	**3.3500e-003**	**0.2349**	**8.6500e-003**	**0.2435**	**0.0632**	**8.4200e-003**	**0.0716**	**8.0236**	**362.6231**	**370.6467**	**0.4535**	**3.0500e-003**	**382.8938**

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	0.2487	4.7600e-003	0.2170	3.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	2.9734	2.9734	3.9000e-004	5.0000e-005	2.9975
Energy	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	75.8429	75.8429	3.9500e-003	1.4600e-003	76.3776
Mobile	0.1015	0.4987	1.1284	3.0700e-003	0.2349	4.1400e-003	0.2390	0.0632	3.9100e-003	0.0671	0.0000	281.8483	281.8483	0.0132	0.0000	282.1791
Waste						0.0000	0.0000		0.0000	0.0000	7.3320	0.0000	7.3320	0.4333	0.0000	18.1648
Water						0.0000	0.0000		0.0000	0.0000	0.6916	1.9586	2.6501	2.5800e-003	1.5400e-003	3.1748
Total	**0.3547**	**0.5423**	**1.3620**	**3.3500e-003**	**0.2349**	**8.6500e-003**	**0.2435**	**0.0632**	**8.4200e-003**	**0.0716**	**8.0236**	**362.6231**	**370.6467**	**0.4535**	**3.0500e-003**	**382.8938**

	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	7/1/2019	7/8/2019	5	6	
2	Site Preparation	Site Preparation	7/11/2019	7/13/2019	5	2	
3	Grading	Grading	7/14/2019	7/24/2019	5	8	
4	Trenching	Trenching	7/25/2019	7/31/2019	5	5	
5	Building Construction	Building Construction	8/1/2019	5/6/2020	5	200	
6	Architectural Coating	Architectural Coating	5/7/2020	6/3/2020	5	20	
7	Paving	Paving	6/4/2020	6/5/2020	5	2	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 9.9

Acres of Paving: 0

Residential Indoor: 109,350; Residential Outdoor: 36,450; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	1.00	81	0.73
Demolition	Excavators	1	2.80	162	0.38
Demolition	Rubber Tired Dozers	1	4.80	255	0.40
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Excavators	2	1.80	162	0.38
Grading	Graders	1	1.80	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Scrapers	2	4.50	361	0.48
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Trenching	Excavators	1	6.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Building Construction	Cranes	0	7.00	231	0.29
Building Construction	Forklifts	1	2.00	89	0.20
Building Construction	Generator Sets	1	1.80	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	2.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	2.00	63	0.31
Architectural Coating	Air Compressors	1	7.00	78	0.48
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Paving	Pavers	0	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	2	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	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	325.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	11.00	3.00	22.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	4	10.00	0.00	40.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 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	2.3100e-003	0.0241	0.0203	2.0000e-005		1.1400e-003	1.1400e-003		1.0600e-003	1.0600e-003	0.0000	2.1414	2.1414	6.3000e-004	0.0000	2.1571
Total	**2.3100e-003**	**0.0241**	**0.0203**	**2.0000e-005**		**1.1400e-003**	**1.1400e-003**		**1.0600e-003**	**1.0600e-003**	**0.0000**	**2.1414**	**2.1414**	**6.3000e-004**	**0.0000**	**2.1571**

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	1.2000e-004	9.0000e-005	9.3000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1790	0.1790	1.0000e-005	0.0000	0.1792
Total	**1.2000e-004**	**9.0000e-005**	**9.3000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1790**	**0.1790**	**1.0000e-005**	**0.0000**	**0.1792**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7000e-004	0.0112	0.0141	2.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	2.1414	2.1414	6.3000e-004	0.0000	2.1571
Total	**5.7000e-004**	**0.0112**	**0.0141**	**2.0000e-005**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**2.1414**	**2.1414**	**6.3000e-004**	**0.0000**	**2.1571**

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	1.2000e-004	9.0000e-005	9.3000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1790	0.1790	1.0000e-005	0.0000	0.1792
Total	**1.2000e-004**	**9.0000e-005**	**9.3000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1790**	**0.1790**	**1.0000e-005**	**0.0000**	**0.1792**

3.3 Site Preparation - 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					

Fugitive Dust					5.3100e-003	0.0000	5.3100e-003	2.9200e-003	0.0000	2.9200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2000e-003	0.0126	5.7600e-003	1.0000e-005		6.5000e-004	6.5000e-004		6.0000e-004	6.0000e-004	0.0000	0.9152	0.9152	2.9000e-004	0.0000	0.9225
Total	**1.2000e-003**	**0.0126**	**5.7600e-003**	**1.0000e-005**	**5.3100e-003**	**6.5000e-004**	**5.9600e-003**	**2.9200e-003**	**6.0000e-004**	**3.5200e-003**	**0.0000**	**0.9152**	**0.9152**	**2.9000e-004**	**0.0000**	**0.9225**

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	3.0000e-005	2.0000e-005	1.9000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0373	0.0373	0.0000	0.0000	0.0373
Total	**3.0000e-005**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0373**	**0.0373**	**0.0000**	**0.0000**	**0.0373**

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					2.3900e-003	0.0000	2.3900e-003	6.6000e-004	0.0000	6.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5000e-004	5.0500e-003	6.0100e-003	1.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.9152	0.9152	2.9000e-004	0.0000	0.9225
Total	**2.5000e-004**	**5.0500e-003**	**6.0100e-003**	**1.0000e-005**	**2.3900e-003**	**4.0000e-005**	**2.4300e-003**	**6.6000e-004**	**4.0000e-005**	**7.0000e-004**	**0.0000**	**0.9152**	**0.9152**	**2.9000e-004**	**0.0000**	**0.9225**

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	3.0000e-005	2.0000e-005	1.9000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0373	0.0373	0.0000	0.0000	0.0373
Total	**3.0000e-005**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0373**	**0.0373**	**0.0000**	**0.0000**	**0.0373**

3.4 Grading - 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					
Fugitive Dust					0.0235	0.0000	0.0235	0.0105	0.0000	0.0105	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9700e-003	0.1021	0.0714	1.1000e-004		4.3900e-003	4.3900e-003		4.0300e-003	4.0300e-003	0.0000	9.7817	9.7817	3.0900e-003	0.0000	9.8591
Total	**8.9700e-003**	**0.1021**	**0.0714**	**1.1000e-004**	**0.0235**	**4.3900e-003**	**0.0279**	**0.0105**	**4.0300e-003**	**0.0146**	**0.0000**	**9.7817**	**9.7817**	**3.0900e-003**	**0.0000**	**9.8591**

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	1.5200e-003	0.0525	0.0107	1.3000e-004	2.7000e-003	2.6000e-004	2.9600e-003	7.4000e-004	2.5000e-004	9.9000e-004	0.0000	12.6455	12.6455	8.0000e-004	0.0000	12.6656
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	3.1000e-004	2.3000e-004	2.3300e-003	0.0000	4.7000e-004	0.0000	4.7000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4476	0.4476	2.0000e-005	0.0000	0.4480
Total	**1.8300e-003**	**0.0527**	**0.0131**	**1.3000e-004**	**3.1700e-003**	**2.6000e-004**	**3.4300e-003**	**8.7000e-004**	**2.5000e-004**	**1.1200e-003**	**0.0000**	**13.0931**	**13.0931**	**8.2000e-004**	**0.0000**	**13.1136**

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					0.0106	0.0000	0.0106	2.3700e-003	0.0000	2.3700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.6700e-003	0.0516	0.0612	1.1000e-004		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	9.7817	9.7817	3.0900e-003	0.0000	9.8591
Total	**2.6700e-003**	**0.0516**	**0.0612**	**1.1000e-004**	**0.0106**	**3.0000e-004**	**0.0109**	**2.3700e-003**	**3.0000e-004**	**2.6700e-003**	**0.0000**	**9.7817**	**9.7817**	**3.0900e-003**	**0.0000**	**9.8591**

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	1.5200e-003	0.0525	0.0107	1.3000e-004	2.7000e-003	2.6000e-004	2.9600e-003	7.4000e-004	2.5000e-004	9.9000e-004	0.0000	12.6455	12.6455	8.0000e-004	0.0000	12.6656
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	3.1000e-004	2.3000e-004	2.3300e-003	0.0000	4.7000e-004	0.0000	4.7000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4476	0.4476	2.0000e-005	0.0000	0.4480

Total	**1.8300e-003**	**0.0527**	**0.0131**	**1.3000e-004**	**3.1700e-003**	**2.6000e-004**	**3.4300e-003**	**8.7000e-004**	**2.5000e-004**	**1.1200e-003**	**0.0000**	**13.0931**	**13.0931**	**8.2000e-004**	**0.0000**	**13.1136**

3.5 Trenching - 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	1.0700e-003	0.0109	0.0119	2.0000e-005		6.3000e-004	6.3000e-004		5.8000e-004	5.8000e-004	0.0000	1.5669	1.5669	5.0000e-004	0.0000	1.5793
Total	**1.0700e-003**	**0.0109**	**0.0119**	**2.0000e-005**		**6.3000e-004**	**6.3000e-004**		**5.8000e-004**	**5.8000e-004**	**0.0000**	**1.5669**	**1.5669**	**5.0000e-004**	**0.0000**	**1.5793**

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	5.0000e-005	4.9000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0933	0.0933	0.0000	0.0000	0.0933
Total	**6.0000e-005**	**5.0000e-005**	**4.9000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0933**	**0.0933**	**0.0000**	**0.0000**	**0.0933**

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	4.3000e-004	8.9400e-003	0.0132	2.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.5669	1.5669	5.0000e-004	0.0000	1.5793
Total	**4.3000e-004**	**8.9400e-003**	**0.0132**	**2.0000e-005**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**1.5669**	**1.5669**	**5.0000e-004**	**0.0000**	**1.5793**

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	5.0000e-005	4.9000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0933	0.0933	0.0000	0.0000	0.0933
Total	**6.0000e-005**	**5.0000e-005**	**4.9000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0933**	**0.0933**	**0.0000**	**0.0000**	**0.0933**

3.6 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	0.0108	0.0976	0.0933	1.4000e-004		6.4000e-003	6.4000e-003		6.1100e-003	6.1100e-003	0.0000	12.6026	12.6026	2.2300e-003	0.0000	12.6584
Total	**0.0108**	**0.0976**	**0.0933**	**1.4000e-004**		**6.4000e-003**	**6.4000e-003**		**6.1100e-003**	**6.1100e-003**	**0.0000**	**12.6026**	**12.6026**	**2.2300e-003**	**0.0000**	**12.6584**

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	6.0000e-005	1.9400e-003	4.0000e-004	0.0000	1.6000e-004	1.0000e-005	1.7000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.4665	0.4665	3.0000e-005	0.0000	0.4673
Vendor	8.2000e-004	0.0217	5.7400e-003	4.0000e-005	1.0600e-003	1.7000e-004	1.2300e-003	3.1000e-004	1.6000e-004	4.7000e-004	0.0000	4.2291	4.2291	2.8000e-004	0.0000	4.2361
Worker	3.1100e-003	2.3500e-003	0.0233	5.0000e-005	4.7000e-003	4.0000e-005	4.7400e-003	1.2500e-003	4.0000e-005	1.2900e-003	0.0000	4.4722	4.4722	1.8000e-004	0.0000	4.4767
Total	**3.9900e-003**	**0.0260**	**0.0295**	**9.0000e-005**	**5.9200e-003**	**2.2000e-004**	**6.1400e-003**	**1.6000e-003**	**2.1000e-004**	**1.8100e-003**	**0.0000**	**9.1678**	**9.1678**	**4.9000e-004**	**0.0000**	**9.1801**

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	3.1600e-003	0.0722	0.0975	1.4000e-004		7.6000e-004	7.6000e-004		7.6000e-004	7.6000e-004	0.0000	12.6026	12.6026	2.2300e-003	0.0000	12.6584
Total	**3.1600e-003**	**0.0722**	**0.0975**	**1.4000e-004**		**7.6000e-004**	**7.6000e-004**		**7.6000e-004**	**7.6000e-004**	**0.0000**	**12.6026**	**12.6026**	**2.2300e-003**	**0.0000**	**12.6584**

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	6.0000e-005	1.9400e-003	4.0000e-004	0.0000	1.6000e-004	1.0000e-005	1.7000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.4665	0.4665	3.0000e-005	0.0000	0.4673
Vendor	8.2000e-004	0.0217	5.7400e-003	4.0000e-005	1.0600e-003	1.7000e-004	1.2300e-003	3.1000e-004	1.6000e-004	4.7000e-004	0.0000	4.2291	4.2291	2.8000e-004	0.0000	4.2361
Worker	3.1100e-003	2.3500e-003	0.0233	5.0000e-005	4.7000e-003	4.0000e-005	4.7400e-003	1.2500e-003	4.0000e-005	1.2900e-003	0.0000	4.4722	4.4722	1.8000e-004	0.0000	4.4767
Total	**3.9900e-003**	**0.0260**	**0.0295**	**9.0000e-005**	**5.9200e-003**	**2.2000e-004**	**6.1400e-003**	**1.6000e-003**	**2.1000e-004**	**1.8100e-003**	**0.0000**	**9.1678**	**9.1678**	**4.9000e-004**	**0.0000**	**9.1801**

3.6 Building Construction - 2020

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	8.1100e-003	0.0743	0.0773	1.2000e-004		4.6200e-003	4.6200e-003		4.4100e-003	4.4100e-003	0.0000	10.4176	10.4176	1.8200e-003	0.0000	10.4632
Total	**8.1100e-003**	**0.0743**	**0.0773**	**1.2000e-004**		**4.6200e-003**	**4.6200e-003**		**4.4100e-003**	**4.4100e-003**	**0.0000**	**10.4176**	**10.4176**	**1.8200e-003**	**0.0000**	**10.4632**

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	4.0000e-005	1.4800e-003	3.0000e-004	0.0000	1.6000e-004	1.0000e-005	1.6000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.3856	0.3856	2.0000e-005	0.0000	0.3862
Vendor	5.4000e-004	0.0164	4.1400e-003	4.0000e-005	8.8000e-004	9.0000e-005	9.7000e-004	2.6000e-004	8.0000e-005	3.4000e-004	0.0000	3.5143	3.5143	2.2000e-004	0.0000	3.5197
Worker	2.3900e-003	1.7300e-003	0.0174	4.0000e-005	3.9300e-003	3.0000e-005	3.9600e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.6184	3.6184	1.3000e-004	0.0000	3.6218
Total	**2.9700e-003**	**0.0196**	**0.0219**	**8.0000e-005**	**4.9700e-003**	**1.3000e-004**	**5.0900e-003**	**1.3500e-003**	**1.2000e-004**	**1.4700e-003**	**0.0000**	**7.5183**	**7.5183**	**3.7000e-004**	**0.0000**	**7.5276**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6400e-003	0.0603	0.0814	1.2000e-004		6.3000e-004	6.3000e-004		6.3000e-004	6.3000e-004	0.0000	10.4176	10.4176	1.8200e-003	0.0000	10.4632
Total	**2.6400e-003**	**0.0603**	**0.0814**	**1.2000e-004**		**6.3000e-004**	**6.3000e-004**		**6.3000e-004**	**6.3000e-004**	**0.0000**	**10.4176**	**10.4176**	**1.8200e-003**	**0.0000**	**10.4632**

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	4.0000e-005	1.4800e-003	3.0000e-004	0.0000	1.6000e-004	1.0000e-005	1.6000e-004	4.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.3856	0.3856	2.0000e-005	0.0000	0.3862
Vendor	5.4000e-004	0.0164	4.1400e-003	4.0000e-005	8.8000e-004	9.0000e-005	9.7000e-004	2.6000e-004	8.0000e-005	3.4000e-004	0.0000	3.5143	3.5143	2.2000e-004	0.0000	3.5197
Worker	2.3900e-003	1.7300e-003	0.0174	4.0000e-005	3.9300e-003	3.0000e-005	3.9600e-003	1.0500e-003	3.0000e-005	1.0800e-003	0.0000	3.6184	3.6184	1.3000e-004	0.0000	3.6218

Total	**2.9700e-003**	**0.0196**	**0.0219**	**8.0000e-005**	**4.9700e-003**	**1.3000e-004**	**5.0900e-003**	**1.3500e-003**	**1.2000e-004**	**1.4700e-003**	**0.0000**	**7.5183**	**7.5183**	**3.7000e-004**	**0.0000**	**7.5276**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3801					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9200e-003	0.0213	0.0241	4.0000e-005		1.3300e-003	1.3300e-003		1.3300e-003	1.3300e-003	0.0000	3.3476	3.3476	3.5000e-004	0.0000	3.3564
Total	**0.3831**	**0.0213**	**0.0241**	**4.0000e-005**		**1.3300e-003**	**1.3300e-003**		**1.3300e-003**	**1.3300e-003**	**0.0000**	**3.3476**	**3.3476**	**3.5000e-004**	**0.0000**	**3.3564**

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	1.0000e-004	7.0000e-005	7.0000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1446	0.1446	1.0000e-005	0.0000	0.1447
Total	**1.0000e-004**	**7.0000e-005**	**7.0000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1446**	**0.1446**	**1.0000e-005**	**0.0000**	**0.1447**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3801					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-004	0.0182	0.0246	4.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	3.3476	3.3476	3.5000e-004	0.0000	3.3564
Total	**0.3809**	**0.0182**	**0.0246**	**4.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**	**0.0000**	**3.3476**	**3.3476**	**3.5000e-004**	**0.0000**	**3.3564**

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	1.0000e-004	7.0000e-005	7.0000e-004	0.0000	1.6000e-004	0.0000	1.6000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.1446	0.1446	1.0000e-005	0.0000	0.1447
Total	**1.0000e-004**	**7.0000e-005**	**7.0000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1446**	**0.1446**	**1.0000e-005**	**0.0000**	**0.1447**

3.8 Paving - 2020

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	8.3000e-004	8.4300e-003	8.9900e-003	1.0000e-005		5.1000e-004	5.1000e-004		4.7000e-004	4.7000e-004	0.0000	1.1341	1.1341	3.7000e-004	0.0000	1.1433
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3000e-004**	**8.4300e-003**	**8.9900e-003**	**1.0000e-005**		**5.1000e-004**	**5.1000e-004**		**4.7000e-004**	**4.7000e-004**	**0.0000**	**1.1341**	**1.1341**	**3.7000e-004**	**0.0000**	**1.1433**

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	1.6000e-004	5.9100e-003	1.2000e-003	2.0000e-005	3.3000e-004	2.0000e-005	3.5000e-004	9.0000e-005	2.0000e-005	1.1000e-004	0.0000	1.5407	1.5407	9.0000e-005	0.0000	1.5431
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	5.0000e-005	3.0000e-005	3.5000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0723	0.0723	0.0000	0.0000	0.0724
Total	**2.1000e-004**	**5.9400e-003**	**1.5500e-003**	**2.0000e-005**	**4.1000e-004**	**2.0000e-005**	**4.3000e-004**	**1.1000e-004**	**2.0000e-005**	**1.3000e-004**	**0.0000**	**1.6130**	**1.6130**	**9.0000e-005**	**0.0000**	**1.6154**

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	3.2000e-004	6.8800e-003	9.7700e-003	1.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	1.1341	1.1341	3.7000e-004	0.0000	1.1433
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2000e-004**	**6.8800e-003**	**9.7700e-003**	**1.0000e-005**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**1.1341**	**1.1341**	**3.7000e-004**	**0.0000**	**1.1433**

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	1.6000e-004	5.9100e-003	1.2000e-003	2.0000e-005	3.3000e-004	2.0000e-005	3.5000e-004	9.0000e-005	2.0000e-005	1.1000e-004	0.0000	1.5407	1.5407	9.0000e-005	0.0000	1.5431
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	5.0000e-005	3.0000e-005	3.5000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0723	0.0723	0.0000	0.0000	0.0724
Total	**2.1000e-004**	**5.9400e-003**	**1.5500e-003**	**2.0000e-005**	**4.1000e-004**	**2.0000e-005**	**4.3000e-004**	**1.1000e-004**	**2.0000e-005**	**1.3000e-004**	**0.0000**	**1.6130**	**1.6130**	**9.0000e-005**	**0.0000**	**1.6154**

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	0.1015	0.4987	1.1284	3.0700e-003	0.2349	4.1400e-003	0.2390	0.0632	3.9100e-003	0.0671	0.0000	281.8483	281.8483	0.0132	0.0000	282.1791
Unmitigated	0.1015	0.4987	1.1284	3.0700e-003	0.2349	4.1400e-003	0.2390	0.0632	3.9100e-003	0.0671	0.0000	281.8483	281.8483	0.0132	0.0000	282.1791

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	276.08	287.39	249.98	632,757	632,757
Total	276.08	287.39	249.98	632,757	632,757

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
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190

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	30.8632	30.8632	3.0900e-003	6.4000e-004	31.1306
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	30.8632	30.8632	3.0900e-003	6.4000e-004	31.1306
NaturalGas Mitigated	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	44.9797	44.9797	8.6000e-004	8.2000e-004	45.2470
NaturalGas Unmitigated	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	44.9797	44.9797	8.6000e-004	8.2000e-004	45.2470

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					
Single Family Housing	842888	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	44.9797	44.9797	8.6000e-004	8.2000e-004	45.2470
Total		**4.5400e-003**	**0.0388**	**0.0165**	**2.5000e-004**		**3.1400e-003**	**3.1400e-003**		**3.1400e-003**	**3.1400e-003**	**0.0000**	**44.9797**	**44.9797**	**8.6000e-004**	**8.2000e-004**	**45.2470**

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					
Single Family Housing	842888	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	44.9797	44.9797	8.6000e-004	8.2000e-004	45.2470
Total		**4.5400e-003**	**0.0388**	**0.0165**	**2.5000e-004**		**3.1400e-003**	**3.1400e-003**		**3.1400e-003**	**3.1400e-003**	**0.0000**	**44.9797**	**44.9797**	**8.6000e-004**	**8.2000e-004**	**45.2470**

5.3 Energy by Land Use - Electricity

Unmitigated

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

Single Family Housing	234627	30.8632	3.0900e-003	6.4000e-004	31.1306
Total		**30.8632**	**3.0900e-003**	**6.4000e-004**	**31.1306**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	234627	30.8632	3.0900e-003	6.4000e-004	31.1306
Total		**30.8632**	**3.0900e-003**	**6.4000e-004**	**31.1306**

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	0.2487	4.7600e-003	0.2170	3.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	2.9734	2.9734	3.9000e-004	5.0000e-005	2.9975
Unmitigated	0.2487	4.7600e-003	0.2170	3.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	2.9734	2.9734	3.9000e-004	5.0000e-005	2.9975

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	0.0380					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2039					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.6000e-004	2.2600e-003	9.6000e-004	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6216	2.6216	5.0000e-005	5.0000e-005	2.6372
Landscaping	6.5800e-003	2.5000e-003	0.2160	1.0000e-005		1.1900e-003	1.1900e-003		1.1900e-003	1.1900e-003	0.0000	0.3517	0.3517	3.4000e-004	0.0000	0.3603
Total	**0.2487**	**4.7600e-003**	**0.2170**	**2.0000e-005**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**2.9734**	**2.9734**	**3.9000e-004**	**5.0000e-005**	**2.9975**

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	0.0380					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2039					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.6000e-004	2.2600e-003	9.6000e-004	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6216	2.6216	5.0000e-005	5.0000e-005	2.6372
Landscaping	6.5800e-003	2.5000e-003	0.2160	1.0000e-005		1.1900e-003	1.1900e-003		1.1900e-003	1.1900e-003	0.0000	0.3517	0.3517	3.4000e-004	0.0000	0.3603
Total	**0.2487**	**4.7600e-003**	**0.2170**	**2.0000e-005**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**2.9734**	**2.9734**	**3.9000e-004**	**5.0000e-005**	**2.9975**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.6501	2.5800e-003	1.5400e-003	3.1748
Unmitigated	2.6501	2.5800e-003	1.5400e-003	3.1748

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.95462 / 1.23226	2.6501	2.5800e-003	1.5400e-003	3.1748
Total		**2.6501**	**2.5800e-003**	**1.5400e-003**	**3.1748**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.95462 / 1.23226	2.6501	2.5800e-003	1.5400e-003	3.1748
Total		**2.6501**	**2.5800e-003**	**1.5400e-003**	**3.1748**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	7.3320	0.4333	0.0000	18.1648
Unmitigated	7.3320	0.4333	0.0000	18.1648

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Single Family Housing	36.12	7.3320	0.4333	0.0000	18.1648
Total		**7.3320**	**0.4333**	**0.0000**	**18.1648**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	36.12	7.3320	0.4333	0.0000	18.1648
Total		**7.3320**	**0.4333**	**0.0000**	**18.1648**

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

River Bend - Phase 1 Construction - Sonoma-San Francisco County, Annual

River Bend - Phase 1 Construction

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	29.00	Dwelling Unit	4.00	52,200.00	83

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**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

Land Use - Unit count and lot acreage from updated plans

Construction Phase - Anticipated schedule provided by applicant adjusted to 2019 start

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Off-road Equipment - Proposed equipment list provided by applicant

Trips and VMT - Bldg: 22 one-way cement truck trips. Paving: 315 cy asphalt @16cy/truck = 40 trips. 1 mile trip lengths.

Grading - 2,600 cy soil import

Architectural Coating -

Vehicle Trips -

Woodstoves - no wood burning nat gas = 21

Water And Wastewater - wtp treatment

Construction Off-road Equipment Mitigation - Tier 3 DPF 3

Energy Use -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Parking	150	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
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tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
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tblConstEquipMitigation	DPF	No Change	Level 3
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	18.00	20.00
tblConstructionPhase	NumDays	230.00	200.00
tblConstructionPhase	NumDays	20.00	6.00
tblConstructionPhase	NumDays	18.00	2.00
tblConstructionPhase	NumDays	5.00	2.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	7.50	21.00
tblFireplaces	NumberWood	12.90	0.00
tblGrading	MaterialImported	0.00	2,600.00
tblLandUse	LotAcreage	9.42	4.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	158.00	162.00
tblOffRoadEquipment	HorsePower	187.00	174.00

tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	247.00	255.00
tblOffRoadEquipment	HorsePower	367.00	361.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Trenching
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Trenching
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	8.00	1.00
tblOffRoadEquipment	UsageHours	8.00	2.80
tblOffRoadEquipment	UsageHours	8.00	1.80

tblOffRoadEquipment	UsageHours	8.00	2.00
tblOffRoadEquipment	UsageHours	8.00	1.80
tblOffRoadEquipment	UsageHours	8.00	1.80
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
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tblOffRoadEquipment	UsageHours	8.00	7.00
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tblOffRoadEquipment	UsageHours	8.00	7.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
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tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripLength	20.00	1.00
tblTripsAndVMT	HaulingTripNumber	0.00	22.00
tblTripsAndVMT	HaulingTripNumber	0.00	40.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
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tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	VendorTripLength	7.30	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00

tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblTripsAndVMT	WorkerTripLength	10.80	1.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	WoodstoveWoodMass	956.80	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					
2019	0.0264	0.2779	0.2168	3.4000e-004	0.0296	0.0133	0.0429	0.0137	0.0125	0.0261	0.0000	30.7003	30.7003	7.3000e-003	0.0000	30.8829
2020	0.3932	0.1166	0.1184	1.9000e-004	5.4000e-004	6.4900e-003	7.0300e-003	1.5000e-004	6.2300e-003	6.3800e-003	0.0000	16.6306	16.6306	2.7500e-003	0.0000	16.6994
Maximum	**0.3932**	**0.2779**	**0.2168**	**3.4000e-004**	**0.0296**	**0.0133**	**0.0429**	**0.0137**	**0.0125**	**0.0261**	**0.0000**	**30.7003**	**30.7003**	**7.3000e-003**	**0.0000**	**30.8829**

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					

2019	9.0900e-003	0.1796	0.2062	3.4000e-004	0.0138	1.3300e-003	0.0151	3.2500e-003	1.3300e-003	4.5700e-003	0.0000	30.7002	30.7002	7.3000e-003	0.0000	30.8828
2020	0.3850	0.0980	0.1238	1.9000e-004	5.4000e-004	9.2000e-004	1.4600e-003	1.5000e-004	9.2000e-004	1.0600e-003	0.0000	16.6306	16.6306	2.7500e-003	0.0000	16.6994
Maximum	**0.3850**	**0.1796**	**0.2062**	**3.4000e-004**	**0.0138**	**1.3300e-003**	**0.0151**	**3.2500e-003**	**1.3300e-003**	**4.5700e-003**	**0.0000**	**30.7002**	**30.7002**	**7.3000e-003**	**0.0000**	**30.8828**

	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	**6.05**	**29.65**	**1.59**	**0.00**	**52.52**	**88.62**	**66.83**	**75.38**	**87.96**	**82.68**	**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)
2	**6-27-2019**	**9-26-2019**	0.2248	0.1310
3	**9-27-2019**	**12-26-2019**	0.0734	0.0537
4	**12-27-2019**	**3-26-2020**	0.0675	0.0532
5	**3-27-2020**	**6-26-2020**	0.4428	0.4299
		Highest	0.4428	0.4299

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	0.2487	4.7600e-003	0.2170	3.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	2.9734	2.9734	3.9000e-004	5.0000e-005	2.9975
Energy	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	75.8429	75.8429	3.9500e-003	1.4600e-003	76.3776
Mobile	0.1015	0.4987	1.1284	3.0700e-003	0.2349	4.1400e-003	0.2390	0.0632	3.9100e-003	0.0671	0.0000	281.8483	281.8483	0.0132	0.0000	282.1791
Waste						0.0000	0.0000		0.0000	0.0000	7.3320	0.0000	7.3320	0.4333	0.0000	18.1648
Water						0.0000	0.0000		0.0000	0.0000	0.6916	1.9586	2.6501	2.5800e-003	1.5400e-003	3.1748
Total	**0.3547**	**0.5423**	**1.3620**	**3.3500e-003**	**0.2349**	**8.6500e-003**	**0.2435**	**0.0632**	**8.4200e-003**	**0.0716**	**8.0236**	**362.6231**	**370.6467**	**0.4535**	**3.0500e-003**	**382.8938**

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	0.2487	4.7600e-003	0.2170	3.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	2.9734	2.9734	3.9000e-004	5.0000e-005	2.9975
Energy	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	75.8429	75.8429	3.9500e-003	1.4600e-003	76.3776
Mobile	0.1015	0.4987	1.1284	3.0700e-003	0.2349	4.1400e-003	0.2390	0.0632	3.9100e-003	0.0671	0.0000	281.8483	281.8483	0.0132	0.0000	282.1791
Waste						0.0000	0.0000		0.0000	0.0000	7.3320	0.0000	7.3320	0.4333	0.0000	18.1648
Water						0.0000	0.0000		0.0000	0.0000	0.6916	1.9586	2.6501	2.5800e-003	1.5400e-003	3.1748
Total	**0.3547**	**0.5423**	**1.3620**	**3.3500e-003**	**0.2349**	**8.6500e-003**	**0.2435**	**0.0632**	**8.4200e-003**	**0.0716**	**8.0236**	**362.6231**	**370.6467**	**0.4535**	**3.0500e-003**	**382.8938**

	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	7/1/2019	7/8/2019	5	6	
2	Site Preparation	Site Preparation	7/11/2019	7/13/2019	5	2	
3	Grading	Grading	7/14/2019	7/24/2019	5	8	
4	Trenching	Trenching	7/25/2019	7/31/2019	5	5	
5	Building Construction	Building Construction	8/1/2019	5/6/2020	5	200	
6	Architectural Coating	Architectural Coating	5/7/2020	6/3/2020	5	20	
7	Paving	Paving	6/4/2020	6/5/2020	5	2	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 9.9

Acres of Paving: 0

Residential Indoor: 109,350; Residential Outdoor: 36,450; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	1.00	81	0.73
Demolition	Excavators	1	2.80	162	0.38
Demolition	Rubber Tired Dozers	1	4.80	255	0.40
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Excavators	2	1.80	162	0.38
Grading	Graders	1	1.80	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Scrapers	2	4.50	361	0.48
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Trenching	Excavators	1	6.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	0	7.00	231	0.29
Building Construction	Forklifts	1	2.00	89	0.20
Building Construction	Generator Sets	1	1.80	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	2.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	2.00	63	0.31
Architectural Coating	Air Compressors	1	7.00	78	0.48
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Paving	Pavers	0	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36

Paving	Rollers	1	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	2	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	3	8.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	325.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	11.00	3.00	22.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	2.00	0.00	0.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT
Paving	4	10.00	0.00	40.00	1.00	1.00	1.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 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	2.3100e-003	0.0241	0.0203	2.0000e-005		1.1400e-003	1.1400e-003		1.0600e-003	1.0600e-003	0.0000	2.1414	2.1414	6.3000e-004	0.0000	2.1571

Total	**2.3100e-003**	**0.0241**	**0.0203**	**2.0000e-005**		**1.1400e-003**	**1.1400e-003**		**1.0600e-003**	**1.0600e-003**	**0.0000**	**2.1414**	**2.1414**	**6.3000e-004**	**0.0000**	**2.1571**

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	4.0000e-005	2.0000e-005	2.6000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0213	0.0213	0.0000	0.0000	0.0213
Total	**4.0000e-005**	**2.0000e-005**	**2.6000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0213**	**0.0213**	**0.0000**	**0.0000**	**0.0213**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.7000e-004	0.0112	0.0141	2.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	2.1414	2.1414	6.3000e-004	0.0000	2.1571
Total	**5.7000e-004**	**0.0112**	**0.0141**	**2.0000e-005**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**2.1414**	**2.1414**	**6.3000e-004**	**0.0000**	**2.1571**

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	4.0000e-005	2.0000e-005	2.6000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0213	0.0213	0.0000	0.0000	0.0213
Total	**4.0000e-005**	**2.0000e-005**	**2.6000e-004**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0213**	**0.0213**	**0.0000**	**0.0000**	**0.0213**

3.3 Site Preparation - 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					
Fugitive Dust					5.3100e-003	0.0000	5.3100e-003	2.9200e-003	0.0000	2.9200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2000e-003	0.0126	5.7600e-003	1.0000e-005		6.5000e-004	6.5000e-004		6.0000e-004	6.0000e-004	0.0000	0.9152	0.9152	2.9000e-004	0.0000	0.9225
Total	**1.2000e-003**	**0.0126**	**5.7600e-003**	**1.0000e-005**	**5.3100e-003**	**6.5000e-004**	**5.9600e-003**	**2.9200e-003**	**6.0000e-004**	**3.5200e-003**	**0.0000**	**0.9152**	**0.9152**	**2.9000e-004**	**0.0000**	**0.9225**

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	1.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.4300e-003	4.4300e-003	0.0000	0.0000	4.4300e-003
Total	**1.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.4300e-003**	**4.4300e-003**	**0.0000**	**0.0000**	**4.4300e-003**

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					2.3900e-003	0.0000	2.3900e-003	6.6000e-004	0.0000	6.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5000e-004	5.0500e-003	6.0100e-003	1.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.9152	0.9152	2.9000e-004	0.0000	0.9225
Total	**2.5000e-004**	**5.0500e-003**	**6.0100e-003**	**1.0000e-005**	**2.3900e-003**	**4.0000e-005**	**2.4300e-003**	**6.6000e-004**	**4.0000e-005**	**7.0000e-004**	**0.0000**	**0.9152**	**0.9152**	**2.9000e-004**	**0.0000**	**0.9225**

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	1.0000e-005	0.0000	5.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.4300e-003	4.4300e-003	0.0000	0.0000	4.4300e-003
Total	**1.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.4300e-003**	**4.4300e-003**	**0.0000**	**0.0000**	**4.4300e-003**

3.4 Grading - 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					
Fugitive Dust					0.0235	0.0000	0.0235	0.0105	0.0000	0.0105	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9700e-003	0.1021	0.0714	1.1000e-004		4.3900e-003	4.3900e-003		4.0300e-003	4.0300e-003	0.0000	9.7817	9.7817	3.0900e-003	0.0000	9.8591
Total	**8.9700e-003**	**0.1021**	**0.0714**	**1.1000e-004**	**0.0235**	**4.3900e-003**	**0.0279**	**0.0105**	**4.0300e-003**	**0.0146**	**0.0000**	**9.7817**	**9.7817**	**3.0900e-003**	**0.0000**	**9.8591**

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	4.0000e-004	0.0172	3.0600e-003	2.0000e-005	1.4000e-004	3.0000e-005	1.7000e-004	4.0000e-005	3.0000e-005	7.0000e-005	0.0000	1.8288	1.8288	3.2000e-004	0.0000	1.8368
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	1.1000e-004	5.0000e-005	6.5000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0531	0.0531	0.0000	0.0000	0.0532
Total	**5.1000e-004**	**0.0173**	**3.7100e-003**	**2.0000e-005**	**1.8000e-004**	**3.0000e-005**	**2.1000e-004**	**5.0000e-005**	**3.0000e-005**	**8.0000e-005**	**0.0000**	**1.8819**	**1.8819**	**3.2000e-004**	**0.0000**	**1.8900**

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					0.0106	0.0000	0.0106	2.3700e-003	0.0000	2.3700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.6700e-003	0.0516	0.0612	1.1000e-004		3.0000e-004	3.0000e-004		3.0000e-004	3.0000e-004	0.0000	9.7817	9.7817	3.0900e-003	0.0000	9.8591
Total	**2.6700e-003**	**0.0516**	**0.0612**	**1.1000e-004**	**0.0106**	**3.0000e-004**	**0.0109**	**2.3700e-003**	**3.0000e-004**	**2.6700e-003**	**0.0000**	**9.7817**	**9.7817**	**3.0900e-003**	**0.0000**	**9.8591**

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	4.0000e-004	0.0172	3.0600e-003	2.0000e-005	1.4000e-004	3.0000e-005	1.7000e-004	4.0000e-005	3.0000e-005	7.0000e-005	0.0000	1.8288	1.8288	3.2000e-004	0.0000	1.8368
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	1.1000e-004	5.0000e-005	6.5000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0531	0.0531	0.0000	0.0000	0.0532
Total	**5.1000e-004**	**0.0173**	**3.7100e-003**	**2.0000e-005**	**1.8000e-004**	**3.0000e-005**	**2.1000e-004**	**5.0000e-005**	**3.0000e-005**	**8.0000e-005**	**0.0000**	**1.8819**	**1.8819**	**3.2000e-004**	**0.0000**	**1.8900**

3.5 Trenching - 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	1.0700e-003	0.0109	0.0119	2.0000e-005		6.3000e-004	6.3000e-004		5.8000e-004	5.8000e-004	0.0000	1.5669	1.5669	5.0000e-004	0.0000	1.5793

Total	**1.0700e-003**	**0.0109**	**0.0119**	**2.0000e-005**		**6.3000e-004**	**6.3000e-004**		**5.8000e-004**	**5.8000e-004**	**0.0000**	**1.5669**	**1.5669**	**5.0000e-004**	**0.0000**	**1.5793**

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	2.0000e-005	1.0000e-005	1.4000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0111	0.0111	0.0000	0.0000	0.0111
Total	**2.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0111**	**0.0111**	**0.0000**	**0.0000**	**0.0111**

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	4.3000e-004	8.9400e-003	0.0132	2.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.5669	1.5669	5.0000e-004	0.0000	1.5793
Total	**4.3000e-004**	**8.9400e-003**	**0.0132**	**2.0000e-005**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**1.5669**	**1.5669**	**5.0000e-004**	**0.0000**	**1.5793**

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	2.0000e-005	1.0000e-005	1.4000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0111	0.0111	0.0000	0.0000	0.0111
Total	**2.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0111**	**0.0111**	**0.0000**	**0.0000**	**0.0111**

3.6 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	0.0108	0.0976	0.0933	1.4000e-004		6.4000e-003	6.4000e-003		6.1100e-003	6.1100e-003	0.0000	12.6026	12.6026	2.2300e-003	0.0000	12.6584
Total	**0.0108**	**0.0976**	**0.0933**	**1.4000e-004**		**6.4000e-003**	**6.4000e-003**		**6.1100e-003**	**6.1100e-003**	**0.0000**	**12.6026**	**12.6026**	**2.2300e-003**	**0.0000**	**12.6584**

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	1.0000e-005	6.4000e-004	1.1000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0675	0.0675	1.0000e-005	0.0000	0.0678
Vendor	3.6000e-004	0.0121	3.4000e-003	1.0000e-005	1.5000e-004	4.0000e-005	1.8000e-004	4.0000e-005	3.0000e-005	8.0000e-005	0.0000	1.1756	1.1756	1.8000e-004	0.0000	1.1803
Worker	1.0600e-003	5.1000e-004	6.5100e-003	1.0000e-005	4.4000e-004	1.0000e-005	4.5000e-004	1.2000e-004	1.0000e-005	1.3000e-004	0.0000	0.5308	0.5308	4.0000e-005	0.0000	0.5317
Total	**1.4300e-003**	**0.0133**	**0.0100**	**2.0000e-005**	**6.0000e-004**	**5.0000e-005**	**6.4000e-004**	**1.6000e-004**	**4.0000e-005**	**2.1000e-004**	**0.0000**	**1.7739**	**1.7739**	**2.3000e-004**	**0.0000**	**1.7797**

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	3.1600e-003	0.0722	0.0975	1.4000e-004		7.6000e-004	7.6000e-004		7.6000e-004	7.6000e-004	0.0000	12.6026	12.6026	2.2300e-003	0.0000	12.6584
Total	**3.1600e-003**	**0.0722**	**0.0975**	**1.4000e-004**		**7.6000e-004**	**7.6000e-004**		**7.6000e-004**	**7.6000e-004**	**0.0000**	**12.6026**	**12.6026**	**2.2300e-003**	**0.0000**	**12.6584**

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	1.0000e-005	6.4000e-004	1.1000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0675	0.0675	1.0000e-005	0.0000	0.0678
Vendor	3.6000e-004	0.0121	3.4000e-003	1.0000e-005	1.5000e-004	4.0000e-005	1.8000e-004	4.0000e-005	3.0000e-005	8.0000e-005	0.0000	1.1756	1.1756	1.8000e-004	0.0000	1.1803
Worker	1.0600e-003	5.1000e-004	6.5100e-003	1.0000e-005	4.4000e-004	1.0000e-005	4.5000e-004	1.2000e-004	1.0000e-005	1.3000e-004	0.0000	0.5308	0.5308	4.0000e-005	0.0000	0.5317
Total	**1.4300e-003**	**0.0133**	**0.0100**	**2.0000e-005**	**6.0000e-004**	**5.0000e-005**	**6.4000e-004**	**1.6000e-004**	**4.0000e-005**	**2.1000e-004**	**0.0000**	**1.7739**	**1.7739**	**2.3000e-004**	**0.0000**	**1.7797**

3.6 Building Construction - 2020

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	8.1100e-003	0.0743	0.0773	1.2000e-004		4.6200e-003	4.6200e-003		4.4100e-003	4.4100e-003	0.0000	10.4176	10.4176	1.8200e-003	0.0000	10.4632
Total	**8.1100e-003**	**0.0743**	**0.0773**	**1.2000e-004**		**4.6200e-003**	**4.6200e-003**		**4.4100e-003**	**4.4100e-003**	**0.0000**	**10.4176**	**10.4176**	**1.8200e-003**	**0.0000**	**10.4632**

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	1.0000e-005	5.1000e-004	8.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0571	0.0571	1.0000e-005	0.0000	0.0573
Vendor	2.5000e-004	9.6900e-003	2.4800e-003	1.0000e-005	1.2000e-004	2.0000e-005	1.4000e-004	4.0000e-005	2.0000e-005	5.0000e-005	0.0000	0.9906	0.9906	1.4000e-004	0.0000	0.9941
Worker	8.1000e-004	3.7000e-004	4.8600e-003	0.0000	3.7000e-004	1.0000e-005	3.7000e-004	1.0000e-004	1.0000e-005	1.0000e-004	0.0000	0.4299	0.4299	3.0000e-005	0.0000	0.4306
Total	**1.0700e-003**	**0.0106**	**7.4200e-003**	**1.0000e-005**	**5.0000e-004**	**3.0000e-005**	**5.2000e-004**	**1.4000e-004**	**3.0000e-005**	**1.5000e-004**	**0.0000**	**1.4775**	**1.4775**	**1.8000e-004**	**0.0000**	**1.4819**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6400e-003	0.0603	0.0814	1.2000e-004		6.3000e-004	6.3000e-004		6.3000e-004	6.3000e-004	0.0000	10.4176	10.4176	1.8200e-003	0.0000	10.4632
Total	**2.6400e-003**	**0.0603**	**0.0814**	**1.2000e-004**		**6.3000e-004**	**6.3000e-004**		**6.3000e-004**	**6.3000e-004**	**0.0000**	**10.4176**	**10.4176**	**1.8200e-003**	**0.0000**	**10.4632**

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	1.0000e-005	5.1000e-004	8.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0571	0.0571	1.0000e-005	0.0000	0.0573
Vendor	2.5000e-004	9.6900e-003	2.4800e-003	1.0000e-005	1.2000e-004	2.0000e-005	1.4000e-004	4.0000e-005	2.0000e-005	5.0000e-005	0.0000	0.9906	0.9906	1.4000e-004	0.0000	0.9941
Worker	8.1000e-004	3.7000e-004	4.8600e-003	0.0000	3.7000e-004	1.0000e-005	3.7000e-004	1.0000e-004	1.0000e-005	1.0000e-004	0.0000	0.4299	0.4299	3.0000e-005	0.0000	0.4306
Total	**1.0700e-003**	**0.0106**	**7.4200e-003**	**1.0000e-005**	**5.0000e-004**	**3.0000e-005**	**5.2000e-004**	**1.4000e-004**	**3.0000e-005**	**1.5000e-004**	**0.0000**	**1.4775**	**1.4775**	**1.8000e-004**	**0.0000**	**1.4819**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3801					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	2.9200e-003	0.0213	0.0241	4.0000e-005		1.3300e-003	1.3300e-003		1.3300e-003	1.3300e-003	0.0000	3.3476	3.3476	3.5000e-004	0.0000	3.3564
Total	**0.3831**	**0.0213**	**0.0241**	**4.0000e-005**		**1.3300e-003**	**1.3300e-003**		**1.3300e-003**	**1.3300e-003**	**0.0000**	**3.3476**	**3.3476**	**3.5000e-004**	**0.0000**	**3.3564**

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	3.0000e-005	1.0000e-005	1.9000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0172	0.0172	0.0000	0.0000	0.0172
Total	**3.0000e-005**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0172**	**0.0172**	**0.0000**	**0.0000**	**0.0172**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.3801					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-004	0.0182	0.0246	4.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	3.3476	3.3476	3.5000e-004	0.0000	3.3564
Total	**0.3809**	**0.0182**	**0.0246**	**4.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**	**0.0000**	**3.3476**	**3.3476**	**3.5000e-004**	**0.0000**	**3.3564**

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	3.0000e-005	1.0000e-005	1.9000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0172	0.0172	0.0000	0.0000	0.0172
Total	**3.0000e-005**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0172**	**0.0172**	**0.0000**	**0.0000**	**0.0172**

3.8 Paving - 2020

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	8.3000e-004	8.4300e-003	8.9900e-003	1.0000e-005		5.1000e-004	5.1000e-004		4.7000e-004	4.7000e-004	0.0000	1.1341	1.1341	3.7000e-004	0.0000	1.1433
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3000e-004**	**8.4300e-003**	**8.9900e-003**	**1.0000e-005**		**5.1000e-004**	**5.1000e-004**		**4.7000e-004**	**4.7000e-004**	**0.0000**	**1.1341**	**1.1341**	**3.7000e-004**	**0.0000**	**1.1433**

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	4.0000e-005	2.0300e-003	3.3000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.2280	0.2280	4.0000e-005	0.0000	0.2289
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-005	1.0000e-005	1.0000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	8.5900e-003	8.5900e-003	0.0000	0.0000	8.6000e-003
Total	**6.0000e-005**	**2.0400e-003**	**4.3000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.2366**	**0.2366**	**4.0000e-005**	**0.0000**	**0.2375**

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	3.2000e-004	6.8800e-003	9.7700e-003	1.0000e-005		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005	0.0000	1.1341	1.1341	3.7000e-004	0.0000	1.1433
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2000e-004**	**6.8800e-003**	**9.7700e-003**	**1.0000e-005**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**1.1341**	**1.1341**	**3.7000e-004**	**0.0000**	**1.1433**

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	4.0000e-005	2.0300e-003	3.3000e-004	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.2280	0.2280	4.0000e-005	0.0000	0.2289
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-005	1.0000e-005	1.0000e-004	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	8.5900e-003	8.5900e-003	0.0000	0.0000	8.6000e-003
Total	**6.0000e-005**	**2.0400e-003**	**4.3000e-004**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.2366**	**0.2366**	**4.0000e-005**	**0.0000**	**0.2375**

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	0.1015	0.4987	1.1284	3.0700e-003	0.2349	4.1400e-003	0.2390	0.0632	3.9100e-003	0.0671	0.0000	281.8483	281.8483	0.0132	0.0000	282.1791
Unmitigated	0.1015	0.4987	1.1284	3.0700e-003	0.2349	4.1400e-003	0.2390	0.0632	3.9100e-003	0.0671	0.0000	281.8483	281.8483	0.0132	0.0000	282.1791

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	276.08	287.39	249.98	632,757	632,757
Total	276.08	287.39	249.98	632,757	632,757

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-...	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.568926	0.041373	0.172015	0.112977	0.030659	0.007080	0.028564	0.025868	0.003029	0.001930	0.005517	0.000872	0.001190

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	30.8632	30.8632	3.0900e-003	6.4000e-004	31.1306
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	30.8632	30.8632	3.0900e-003	6.4000e-004	31.1306
NaturalGas Mitigated	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	44.9797	44.9797	8.6000e-004	8.2000e-004	45.2470
NaturalGas Unmitigated	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	44.9797	44.9797	8.6000e-004	8.2000e-004	45.2470

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					
Single Family Housing	842888	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	44.9797	44.9797	8.6000e-004	8.2000e-004	45.2470
Total		**4.5400e-003**	**0.0388**	**0.0165**	**2.5000e-004**		**3.1400e-003**	**3.1400e-003**		**3.1400e-003**	**3.1400e-003**	**0.0000**	**44.9797**	**44.9797**	**8.6000e-004**	**8.2000e-004**	**45.2470**

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					
Single Family Housing	842888	4.5400e-003	0.0388	0.0165	2.5000e-004		3.1400e-003	3.1400e-003		3.1400e-003	3.1400e-003	0.0000	44.9797	44.9797	8.6000e-004	8.2000e-004	45.2470
Total		**4.5400e-003**	**0.0388**	**0.0165**	**2.5000e-004**		**3.1400e-003**	**3.1400e-003**		**3.1400e-003**	**3.1400e-003**	**0.0000**	**44.9797**	**44.9797**	**8.6000e-004**	**8.2000e-004**	**45.2470**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	234627	30.8632	3.0900e-003	6.4000e-004	31.1306
Total		**30.8632**	**3.0900e-003**	**6.4000e-004**	**31.1306**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
Single Family Housing	234627	30.8632	3.0900e-003	6.4000e-004	31.1306
Total		**30.8632**	**3.0900e-003**	**6.4000e-004**	**31.1306**

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	0.2487	4.7600e-003	0.2170	3.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	2.9734	2.9734	3.9000e-004	5.0000e-005	2.9975
Unmitigated	0.2487	4.7600e-003	0.2170	3.0000e-005		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	2.9734	2.9734	3.9000e-004	5.0000e-005	2.9975

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	0.0380					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consumer Products	0.2039					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.6000e-004	2.2600e-003	9.6000e-004	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6216	2.6216	5.0000e-005	5.0000e-005	2.6372
Landscaping	6.5800e-003	2.5000e-003	0.2160	1.0000e-005		1.1900e-003	1.1900e-003		1.1900e-003	1.1900e-003	0.0000	0.3517	0.3517	3.4000e-004	0.0000	0.3603
Total	**0.2487**	**4.7600e-003**	**0.2170**	**2.0000e-005**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**2.9734**	**2.9734**	**3.9000e-004**	**5.0000e-005**	**2.9975**

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	0.0380					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2039					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.6000e-004	2.2600e-003	9.6000e-004	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6216	2.6216	5.0000e-005	5.0000e-005	2.6372
Landscaping	6.5800e-003	2.5000e-003	0.2160	1.0000e-005		1.1900e-003	1.1900e-003		1.1900e-003	1.1900e-003	0.0000	0.3517	0.3517	3.4000e-004	0.0000	0.3603
Total	**0.2487**	**4.7600e-003**	**0.2170**	**2.0000e-005**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**2.9734**	**2.9734**	**3.9000e-004**	**5.0000e-005**	**2.9975**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			

Mitigated	2.6501	2.5800e-003	1.5400e-003	3.1748
Unmitigated	2.6501	2.5800e-003	1.5400e-003	3.1748

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.95462 / 1.23226	2.6501	2.5800e-003	1.5400e-003	3.1748
Total		**2.6501**	**2.5800e-003**	**1.5400e-003**	**3.1748**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.95462 / 1.23226	2.6501	2.5800e-003	1.5400e-003	3.1748
Total		**2.6501**	**2.5800e-003**	**1.5400e-003**	**3.1748**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	7.3320	0.4333	0.0000	18.1648
Unmitigated	7.3320	0.4333	0.0000	18.1648

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	36.12	7.3320	0.4333	0.0000	18.1648
Total		**7.3320**	**0.4333**	**0.0000**	**18.1648**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e

Land Use	tons	MT/yr			
Single Family Housing	36.12	7.3320	0.4333	0.0000	18.1648
Total		**7.3320**	**0.4333**	**0.0000**	**18.1648**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 3: Screening Health Risk Calculations

Clover Stornetta Dairy Processing Facility DPM Emissions from Trucks

TRU Emissions

Emissions Period	Emission[a] Factor (g/hp-hr)	TRUs Operating per Day	TRU Operation (hours/day)	DPM Emissions		
				Daily (lb/day)	Annual (lb/year)	Average Hourly (g/s)
2018 - 2019	0.02	30	7	0.13	45.86	0.00066
2020 - 2033	0.02	30	7	0.13	45.9	0.00066
2034 - 2047	0.02	30	7	0.13	45.9	0.00066

[a] CARB, 2011. Staff Report: Initial Statement of Reasons for Proposed Rulemaking. 2011 Amendments for the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRUs) and TRU Generator Sets, and Facilities Where TRUs Operate.

TRU Operating Parameters

TRU Horsepower[a] = 29.5

TRU Load Factor[a] = 0.46

Truck Idle Emissions

Emissions Period	Average Emission Factor (g/hr)	On-Site Trucks per Day	Idle Time per Truck (min)	DPM Emissions		
				Daily (lb/day)	Annual (lb/year)	Average Hourly (g/s)
2018 - 2019	0.11950	60	5	0.0013	0.5	6.92E-06
2020 - 2033	0.10218	60	5	0.0011	0.4	5.91E-06
2034 - 2047	0.09930	60	5	0.0011	0.4	5.75E-06

Truck Travel Emissions

Emissions Period	Average Emission Factor (g/mi)	On-Site Trucks per Day	On-Site Truck Route (feet)	DPM Emissions		
				Daily (lb/day)	Annual (lb/year)	Average Hourly (g/s)
2018 - 2019	0.06873	60	1050	0.0018	0.7	9.49E-06
2020 - 2033	0.01794	60	1050	0.0005	0.2	2.48E-06
2034 - 2047	0.00925	60	1050	0.0002	0.1	1.28E-06

Clover Stornetta Dairy Processing Facility Emission Source Parameters for Modeling

TRU Modeling Information

Emissions Period	Number of Emission Points	Total Hourly DPM Emissions (g/s)	Emissions per Source (g/s)	Height (m)	Diameter (m)	Exit Velocity (m/s)	Temp (K)
2018 - 2019	51	0.00066	1.29E-05	4.0	0.051	50	501
2020 - 2033	51	0.00066	1.29E-05	4.0	0.051	50	501
2034 - 2047	51	0.00066	1.29E-05	4.0	0.051	50	501

Truck Idle Modeling Information

Emissions Period	Number of Emission Points	Total Hourly DPM Emissions (g/s)	Emissions per Source (g/s)	Height (m)	Diameter (m)	Exit Velocity (m/s)	Temp (K)
2018 - 2019	51	1.38E-05	2.71E-07	3.84	0.1	51.71	366
2020 - 2033	51	1.18E-05	2.32E-07	3.84	0.1	51.71	366
2034 - 2047	51	1.15E-05	2.25E-07	3.84	0.1	51.71	366

Truck Travel Modeling Information

Emissions Period	Source Type	Total Hourly DPM Emissions (g/s)	Line Source Length (feet)	Plume Width (feet)	Plume Height (meters)	Release Height (meters)
2018 - 2019	Line-Volume	9.49E-06	1050	12	6.8	3.4
2020 - 2033	Line-Volume	2.48E-06	1050	12	6.8	3.4
2034 - 2047	Line-Volume	1.28E-06	1050	12	6.8	3.4

River Bend Crossing, Petaluma, CA
ISCST3 Risk Modeling Parameters and Maximum DPM Concentrations
On-Site Project Residential Receptors (1.5 meter receptor heights)

Receptor Information

Number of Receptors 143
Receptor Height = 1.5 meters
Receptor distances = 6 meter spacing

Meteorological Conditions

BAAQMD Petaluma Airport Hourly Met I 1990 - 1994
Land Use Classification urban
Wind speed = variable
Wind direction = variable

Maximum Modeled Concentrations

Emission Period	DPM Concentration (µg/m^3)		
	TRUs	Truck Idle	Truck Travel
2018-2019	0.0330	0.00050	0.00068
2020-2033	0.0330	0.00043	0.00018
2034-2047	0.0330	0.00041	0.00009

River Bend Crossing, Petaluma, CA - Cancer Risks & PM2.5 Impacts from Clover Stornetta Dairy Processing Facilty
On-Site Project Residential Receptors (1.5 meter receptor heights)
30-Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

Values

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

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	0.85	0.85	0.72	0.73

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

Road Traffic Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
					Annual DPM Conc (ug/m3)						
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	TRU	Idle	Travel	TRU	Idle	Travel	Total
0	2018	0.25	-0.25 - 0*	10	0.0330	0.0005	0.0007	0.38	0.006	0.008	0.40
1	2018	1	1	10	0.0330	0.0005	0.0007	4.61	0.070	0.095	4.77
2	2019	1	2	10	0.0330	0.0005	0.0007	4.61	0.070	0.095	4.77
3	2020	1	3	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
4	2021	1	4	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
5	2022	1	5	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
6	2023	1	6	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
7	2024	1	7	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
8	2025	1	8	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
9	2026	1	9	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
10	2027	1	10	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
11	2028	1	11	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
12	2029	1	12	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
13	2030	1	13	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
14	2031	1	14	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
15	2032	1	15	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
16	2033	1	16	3	0.0330	0.0004	0.0002	0.61	0.008	0.003	0.63
17	2034	1	17	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
18	2035	1	18	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
19	2036	1	19	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
20	2037	1	20	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
21	2038	1	21	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
22	2039	1	22	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
23	2040	1	23	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
24	2041	1	24	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
25	2042	1	25	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
26	2043	1	26	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
27	2044	1	27	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
28	2045	1	28	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
29	2046	1	29	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
30	2047	1	30	1	0.0330	0.0004	0.0001	0.09	0.001	0.000	0.096
Total Increased Cancer Risk			**Total**					19.535	0.27	0.25	**20.1**

* Third trimester of pregnancy

Clover Stornetta Dairy Processing Facility Emission Source Parameters for Modeling
With TRU Mitigation

TRU Modeling Information

Emissions Period	Number of Emission Points	Total Hourly DPM Emissions (g/s)	Emissions per Source (g/s)	Height (m)	Diameter (m)	Exit Velocity (m/s)	Temp (K)
2018 - 2019	42	0.00066	1.57E-05	4.0	0.051	50	501
2020 - 2033	42	0.00066	1.57E-05	4.0	0.051	50	501
2034 - 2047	42	0.00066	1.57E-05	4.0	0.051	50	501

Truck Idle Modeling Information

Emissions Period	Number of Emission Points	Total Hourly DPM Emissions (g/s)	Emissions per Source (g/s)	Height (m)	Diameter (m)	Exit Velocity (m/s)	Temp (K)
2018 - 2019	51	6.92E-06	1.36E-07	3.84	0.1	51.71	366
2020 - 2033	51	5.91E-06	1.16E-07	3.84	0.1	51.71	366
2034 - 2047	51	5.75E-06	1.13E-07	3.84	0.1	51.71	366

Truck Travel Modeling Information

Emissions Period	Source Type	Total Hourly DPM Emissions (g/s)	Line Source Length (feet)	Plume Width (feet)	Plume Height (meters)	Release Height (meters)
2018 - 2019	Line-Volume	9.49E-06	1050	12	6.8	3.4
2020 - 2033	Line-Volume	2.48E-06	1050	12	6.8	3.4
2034 - 2047	Line-Volume	1.28E-06	1050	12	6.8	3.4

River Bend Crossing, Petaluma, CA - With Mitigation
ISCST3 Risk Modeling Parameters and Maximum DPM Concentrations
On-Site Project Residential Receptors (1.5 meter receptor heights)

Receptor Information

Number of Receptors 143
Receptor Height = 1.5 meters
Receptor distances = 6 meter spacing

Meteorological Conditions

BAAQMD Petaluma Airport Hourly Met I 1990 - 1994
Land Use Classification urban
Wind speed = variable
Wind direction = variable

Maximum Modeled Concentrations

Emission Period	DPM Concentration ($\mu g/m^3$)		
	TRUs	Truck Idle	Truck Travel
2018-2019	0.0158	0.00024	0.00063
2020-2033	0.0158	0.00020	0.00016
2034-2047	0.0158	0.00020	0.00008

River Bend Crossing, Petaluma, CA - Cancer Risks & PM2.5 Impacts from Clover Stornetta Dairy Processing Facilty
With Mitigation of TRU Emissions
On-Site Project Residential Receptors (1.5 meter receptor heights)
30-Year Residential Exposure

Cancer Risk Calculation Method

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

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

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

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

Values

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

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	0.85	0.85	0.72	0.73

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

Operational Cancer Risk by Year - Maximum Impact Receptor Location

				Maximum - Exposure Information				Cancer Risk (per million)			
					Annual DPM Conc (ug/m3)						
Exposure Year	Year	Exposure Duration (years)	Age	Age Sensitivity Factor	TRU	Idle	Travel	TRU	Idle	Travel	Total
0	2018	0.25	-0.25 - 0*	10	0.0158	0.0002	0.0006	0.18	0.003	0.007	0.19
1	2018	1	1	10	0.0158	0.0002	0.0006	2.21	0.034	0.088	2.33
2	2019	1	2	10	0.0158	0.0002	0.0006	2.21	0.034	0.088	2.33
3	2020	1	3	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
4	2021	1	4	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
5	2022	1	5	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
6	2023	1	6	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
7	2024	1	7	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
8	2025	1	8	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
9	2026	1	9	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
10	2027	1	10	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
11	2028	1	11	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
12	2029	1	12	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
13	2030	1	13	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
14	2031	1	14	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
15	2032	1	15	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
16	2033	1	16	3	0.0158	0.0002	0.0002	0.29	0.004	0.003	0.30
17	2034	1	17	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
18	2035	1	18	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
19	2036	1	19	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
20	2037	1	20	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
21	2038	1	21	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
22	2039	1	22	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
23	2040	1	23	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
24	2041	1	24	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
25	2042	1	25	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
26	2043	1	26	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
27	2044	1	27	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
28	2045	1	28	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
29	2046	1	29	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
30	2047	1	30	1	0.0158	0.0002	0.0001	0.05	0.001	0.000	0.046
Total Increased Cancer Risk			**Total**					9.348	0.13	0.23	**9.7**

* Third trimester of pregnancy

Hunt and Behrens

Stationary Source: Hunt and Behrens PM2.5 Concentration

PM2.5 Operational Emissions and Modeling Emission Rates - Unmitigated

Operation 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 ($g/s/m^2$)
Hunt and Behrens	0.6930	PM_HB1	1386.0	0.15822	1.99E-02	7,091	2.81E-06
	0.7093	PM_HB2	1418.6	0.16195	2.04E-02	7,258	2.81E-06
	1.4023					14,350	

hr/day =	24	(7am - 4pm)
days/yr =	365	
hours/year =	8760	

PM2.5 Concentration

Location	Maximum Annual PM2.5 Concentration (µg/m3)
Project Site	0.09
Off-site MEI	0.06

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Risk & Hazard Stationary Source Inquiry Form

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

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

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

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

Table A: Requester Contact Information

Date of Request	**3/28/2019**
Contact Name	Mimi McNamara
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-040 X111
Email	mmcnamara@illingworthrodkin.com
Project Name	River Bend Petaluma
Address	529 Madison Steet
City	Petaluma
County	Sonoma
Type (residential, commercial, mixed use, industrial, etc.)	Residential
Project Size (# of units or building square feet)	27 units

Comments: Need the emission files for the following Plants: 13322, 1889.

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

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

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

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

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

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

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

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

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

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

Table B: Google Earth data

Distance from Receptor (feet) or MEI[1]	Facility Name	Address	Plant No.	Cancer Risk[2]	Hazard Risk[2]	$PM_{2.5}$[2]	Source No.[3]	Type of Source[4]	Fuel Code[5]	Status/Comments
	Clover Stornetta Farms Inc	91 Lakeville Street	13322	9.2455634	0.0048	0.01205	S1	Generator		
	Hunt & Behrens Inc	30 Lakeville Street	106418	10.594	0.0523		S1	Gas Dispensing Facility		
	Hunt And Behrens, Inc	30 Lakeville Street	1889	129.420	0.5194	208.258		Multiple		
	Santa Rosa Grand Petroleum Inc	483 E Washington St	109754	15.256	0.0753		S1	Gas Dispensing Facility		Use GDF Multiplier
	Brunsing Associates, Inc	483 E Washington St	16089	1.269	0.0063					no sources currently at this site
	Santa Rosa Grand Petroleum Inc	532 E Washington St	111595	43.260	0.2136	0	S1	GDF		Use GDF Multiplier

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

Date last updated:

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Risk & Hazard Stationary Source Inquiry Form

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

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

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

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

Table A: Requester Contact Information

Date of Request	**3/28/2019**
Contact Name	Mimi McNamara
Affiliation	Illingworth & Rodkin, Inc.
Phone	707-794-040 X111
Email	mmcnamara@illingworthrodkin.com
Project Name	River Bend Petaluma
Address	529 Madison Steet
City	Petaluma
County	Sonoma
Type (residential, commercial, mixed use, industrial, etc.)	Residential
Project Size (# of units or building square feet)	27 units

Comments: Need the emission files for the following Plants: 13322, 1889.

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

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

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

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

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

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

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

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

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

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

Table B: Google Earth data

											Project Site				Construction MEI				
Distance from Receptor (feet) or MEI[1]	Facility Name	Address	Plant No.	Cancer Risk[2]	Hazard Risk[2]	$PM_{2.5}$[2]	Source No.[3]	Type of Source[4]	Fuel Code[5]	Status/Comments	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5	Distance from MEI[1]	Distance Adjustment Multiplier	Adjusted Cancer Risk Estimate	Adjusted Hazard Risk	Adjusted PM2.5
200	Clover Stornetta Farms Inc	91 Lakeville Street	13322	9.2455634	0.0048	0.012047	S1	Generator			0.41	3.79	0.00	0.00	430	0.15	1.4	0.00	0.00
700	Hunt & Behrens Inc	30 Lakeville Street	106418	10.594	0.0523		S1	Gas Dispensing Facility			0.03	0.27	0.00		1000	0.01	0.2	0.00	
700	Hunt And Behrens, Inc	30 Lakeville Street	1889	129.420	0.5194	208.2581		Multiple											
900	Santa Rosa Grand Petroleum Inc	483 E Washington St	109754	15.256	0.0753		S1	Gas Dispensing Facility		Use GDF Multiplier	0.02	0.26	0.00		850	0.02	0.3	0.00	
1000	Santa Rosa Grand Petroleum Inc	532 E Washington St	111595	43.260	0.2136	0	S1	GDF		Use GDF Multiplier	0.01	0.65	0.00		1000	0.01	0.6	0.00	

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

Date last updated:

Step 1:

Plant Name	Hunt and Behrens
Plant No.	1889

Step 3:
Estimate Distance

What is the distance (m) from the facility boundary to the | 215

Step 4:
Specify Source Type

Does facility have only diesel backup generators?	no
Is this analysis for a gas station?	no

Step 5:
Read Estimates

Total Cancer Risk	0.0	per 1,000,000
Total Chronic Hazard	0.00	
Total PM2.5 Concentration	3.34	ug/m^3

Step 2:
Enter Emissions Data

Chemical Name	CAS No.	Emission Rate	Cancer Risk	Chronic Hazard	PM2.5 Concentration
		lbs/year	(no units)	(none)	ug/m3
Fine Particulate Matter [PM2.5]		7.68E+00			16.58
ACETALDEHYDE	75070	0.00E+00			
ACETAMIDE	60355	0.00E+00			
ACROLEIN	107028	0.00E+00			
ACRYLAMIDE	79061	0.00E+00			
ACRYLIC ACID	79107	0.00E+00			
ACRYLONITRILE	107131	0.00E+00			
ALLYL CHLORIDE	107051	0.00E+00			
2-AMINOANTHRAQUINONE	117799	0.00E+00			
AMMONIA	7664417	0.00E+00			
ANILINE	62533	0.00E+00			
ARSENIC AND COMPOUNDS (INORGANIC)[1,2]	7440382	0.00E+00			
ARSINE	7784421	0.00E+00			
ASBESTOS [3]	1332214	0.00E+00			
ATRAZINE[4]	71432	1.12E-04	1.43E-02	7.06E-05	
BENZIDINE (AND ITS SALTS) values also apply to:	92875	0.00E+00			
Benzidine based dyes	92875	0.00E+00			
Direct Black 38	1937377	0.00E+00			
Direct Blue 6	2602462	0.00E+00			
Direct Brown 95 (technical grade)	16071866	0.00E+00			
BENZYL CHLORIDE	100447	0.00E+00			
BERYLLIUM AND COMPOUNDS	7440417	0.00E+00			
BIS(2-CHLOROETHYL)ETHER (Dichloroethyl ether)	111444	0.00E+00			
BIS(CHLOROMETHYL)ETHER	542881	0.00E+00			
BROMINE AND COMPOUNDS see Potassium Bromate	7726956	0.00E+00			
1,3-BUTADIENE	106990	0.00E+00			
CADMIUM AND COMPOUNDS[5]	7440439	0.00E+00			
CAPROLACTAM	105602	0.00E+00			
CARBON DISULFIDE[6]	75150	0.00E+00			
CARBON MONOXIDE	630080	1.53E+00			
CARBON TETRACHLORIDE[7] (Tetrachloromethane)	56235	0.00E+00			
CHLORINATED PARAFFINS	108171262	0.00E+00			
CHLORINE	7782505	0.00E+00			
CHLORINE DIOXIDE	10049044	0.00E+00			
4-CHLORO-O-PHENYLENEDIAMINE	95830	0.00E+00			
CHLOROBENZENE	108907	0.00E+00			
CHLOROFORM[8]	67663	0.00E+00			
Chlorophenols	87865	0.00E+00			
PENTACHLOROPHENOL	87865	0.00E+00			
2,4,6-TRICHLOROPHENOL	88062	0.00E+00			
CHLOROPICRIN	76062	0.00E+00			
p-CHLORO-o-TOLUIDINE	95692	0.00E+00			
CHROMIUM 6+[9]	18540299	0.00E+00			
Barium chromate[9]	10294403	0.00E+00			
Calcium chromate[9]	13765190	0.00E+00			
Lead chromate[9]	7758970	0.00E+00			
Sodium dichromate[9]	10588019	0.00E+00			
Strontium chromate[9]	7789062	0.00E+00			
CHROMIC TRIOXIDE (as chromic acid mist)	1333820	0.00E+00			
COPPER AND COMPOUNDS	7440508	0.00E+00			
p-CRESIDINE	120718	0.00E+00			
CRESOLS	1319773	0.00E+00			
M-CRESOL	108394	0.00E+00			
O-CRESOL	95487	0.00E+00			
P-CRESOL	106445	0.00E+00			
CUPFERRON	135206	0.00E+00			
Cyanide And Compounds (inorganic)	57125	0.00E+00			
HYDROGEN CYANIDE (Hydrocyanic acid)	74908	0.00E+00			
2,4-DIAMINOANISOLE	615054	0.00E+00			
2,4-DIAMINOTOLUENE	95807	0.00E+00			
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96128	0.00E+00			
1,4-DICHLOROBENZENE (p-Dichlorobenzene)	106467	0.00E+00			
3,3-DICHLOROBENZIDINE	91941	0.00E+00			
1,1-DICHLOROETHANE (Ethylidene dichloride)	75343	0.00E+00			
DI(2-ETHYLHEXYL)PHTHALATE (DEHP)	117817	0.00E+00			
DIETHANOLAMINE	111422	0.00E+00			
p-DIMETHYLAMINOAZOBENZENE	60117	0.00E+00			
N,N-DIMETHYL FORMAMIDE	68122	0.00E+00			
2,4-DINITROTOLUENE	121142	0.00E+00			
1,4-DIOXANE (1,4-Diethylene dioxide)	123911	0.00E+00			
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)	106898	0.00E+00			
1,2-EPOXYBUTANE	106887	0.00E+00			
ETHYL BENZENE	100414	0.00E+00			
ETHYL CHLORIDE (Chloroethane)	75003	0.00E+00			
ETHYLENE DIBROMIDE (1,2-Dibromoethane)	106934	0.00E+00			
ETHYLENE DICHLORIDE (1,2-Dichloroethane)	107062	0.00E+00			
ETHYLENE GLYCOL	107211	0.00E+00			
ETHYLENE OXIDE (1,2-Epoxyethane)	75218	0.00E+00			
ETHYLENE THIOUREA	96457	0.00E+00			
Fluorides [10]	7101	0.00E+00			
HYDROGEN FLUORIDE (Hydrofluoric acid)	7664393	0.00E+00			
FORMALDEHYDE	50000	3.94E-03	1.06E-01	8.27E-04	
GLUTARALDEHYDE	111308	0.00E+00			
GLYCOL ETHERS	322311	0.00E+00			
ETHYLENE GLYCOL BUTYL ETHER – EGBE	111762	0.00E+00			
ETHYLENE GLYCOL ETHYL ETHER – EGEE[11]	110805	0.00E+00			
ETHYLENE GLYCOL ETHYL ETHER ACETATE – EGEEA[11]	111159	0.00E+00			
ETHYLENE GLYCOL METHYL ETHER – EGME[11]	109864	0.00E+00			
ETHYLENE GLYCOL METHYL ETHER ACETATE – EGMEA	110496	0.00E+00			
HEXACHLOROBENZENE	118741	0.00E+00			
HEXACHLOROCYCLOHEXANES (mixed or technical grade)	608731	0.00E+00			
alpha-HEXACHLOROCYCLOHEXANE	319846	0.00E+00			
beta- HEXACHLOROCYCLOHEXANE	319857	0.00E+00			
gamma-HEXACHLOROCYCLOHEXANE (Lindane)	58899	0.00E+00			
n-HEXANE	110543	0.00E+00			
HYDRAZINE	302012	0.00E+00			
HYDROCHLORIC ACID (Hydrogen chloride)	7647010	0.00E+00			
HYDROGEN SULFIDE	7783064	0.00E+00			
ISOPHORONE	78591	0.00E+00			
ISOPROPYL ALCOHOL (Isopropanol)	67630	0.00E+00			
LEAD AND COMPOUNDS [12] Inorganic; values also apply to:	7439921	0.00E+00			
Lead acetate[9]	301042	0.00E+00			
Lead phosphate[9]	7446277	0.00E+00			
Lead subacetate[9]	1335326	0.00E+00			
LINDANE (see gamma-Hexachlorocyclohexane)	58899	0.00E+00			
MALEIC ANHYDRIDE	108316	0.00E+00			
MANGANESE AND COMPOUNDS	7439965	0.00E+00			
MERCURY AND COMPOUNDS (INORGANIC)	7439976	0.00E+00			
Mercuric chloride	7487947	0.00E+00			
METHANOL	67561	0.00E+00			
METHYL BROMIDE (Bromomethane)	74839	0.00E+00			
METHYL tertiary-BUTYL ETHER	1634044	0.00E+00			
METHYL CHLOROFORM (1,1,1-Trichloroethane)	71556	0.00E+00			
METHYL ETHYL KETONE (2-Butanone)	78933	0.00E+00			
METHYL ISOCYANATE	624839	0.00E+00			
4,4'-METHYLENE BIS (2-CHLOROANILINE) (MOCA)	101144	0.00E+00			
METHYLENE CHLORIDE (Dichloromethane)	75092	0.00E+00			
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)	101779	0.00E+00			
METHYLENE DIPHENYL ISOCYANATE	101688	0.00E+00			
MICHAEL'S KETONE (4,4'-Bis(dimethylamino)benzophenone)	90948	0.00E+00			
N-NITROSO-n-BUTYLAMINE	924163	0.00E+00			
N-NITROSO-n-PROPYLAMINE	621647	0.00E+00			
N-NITROSODIETHYLAMINE	55185	0.00E+00			
N-NITROSODIMETHYLAMINE	62759	0.00E+00			
N-NITROSODIPHENYLAMINE	86306	0.00E+00			
N-NITROSO-N-METHYLETHYLAMINE	10595956	0.00E+00			
N-NITROSOMORPHOLINE	59892	0.00E+00			
N-NITROSOPIPERIDINE	100754	0.00E+00			
N-NITROSOPYRROLIDINE	930552	0.00E+00			
NAPTHALENE [see Polycyclic aromatic hydrocarbons]	91203	0.00E+00			
NICKEL AND COMPOUNDS[13] *values also apply to:*	7440020	0.00E+00			
Nickel acetate[9]	373024	0.00E+00			
Nickel carbonate[9]	3333679	0.00E+00			
Nickel carbonyl[9]	13463393	0.00E+00			
Nickel hydroxide[9]	12054487	0.00E+00			
Nickelocene[9]	1271289	0.00E+00			
NICKEL OXIDE[9]	1313991	0.00E+00			
Nickel refinery dust from the pyrometallurgical process[9]	7196	0.00E+00			
Nickel subsulfide[9]	12035722	0.00E+00			
NITRIC ACID	7697372	0.00E+00			
NITROGEN DIOXIDE	10102440	0.00E+00			
p-NITRODIPHENYLAMINE	836308	0.00E+00			
OZONE	10028156	0.00E+00			
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES	9195	0.00E+00			
PERCHLOROETHYLENE (Tetrachloroethylene)	127184	0.00E+00			
PHENOL	108952	0.00E+00			
PHOSGENE	75445	0.00E+00			
PHOSPHINE	7803512	0.00E+00			
PHOSPHORIC ACID	7664382	0.00E+00			
PHTHALIC ANHYDRIDE	85449	0.00E+00			
PCB (POLYCHLORINATED BIPHENYLS)	1336363	0.00E+00			
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD) (Treated as 2,3,7,8 TCDD for HRVA) [14]	1746016	0.00E+00			
POLYCHLORINATED DIBENZOFURANS (PCDF) (Treated as 2,3,7,8 TCDD for HRVA) 7	1746016	0.00E+00			
POLYCYCLIC AROMATIC HYDROCARBONS* (PAH OR GAP GROUP)[15]	91203	0.00E+00			
NAPHTHALENE	91203	0.00E+00			
POTASSIUM BROMATE	7758012	0.00E+00			
1,3-PROPANE SULTONE	1120714	0.00E+00			
PROPYLENE (PROPENE)	115071	0.00E+00			
PROPYLENE GLYCOL MONOMETHYL ETHER	107982	0.00E+00			
PROPYLENE OXIDE	75569	0.00E+00			
SELENIUM AND COMPOUNDS	7782492	0.00E+00			
HYDROGEN SELENIDE	7783075	0.00E+00			
Selenium sulfide	7446346	0.00E+00			
SILICA (Crystalline, Respirable)	7631869	0.00E+00			
SODIUM HYDROXIDE	1310732	0.00E+00			
STYRENE	100425	0.00E+00			
SULFATES	9960	0.00E+00			
SULFUR DIOXIDE	7446095	3.52E-02			
SULFURIC ACID	7664939	0.00E+00			
SULFUR TRIOXIDE	7446719	0.00E+00			
OLEUM	8014957	0.00E+00			
1,1,2,2- TETRACHLOROETHANE	79345	0.00E+00			
THIOACETAMIDE	62555	0.00E+00			
TOLUENE	108883	1.78E-04		1.12E-06	
Toluene diisocyanates	26471625	0.00E+00			
TOLUENE-2,4-DIISOCYANATE	584849	0.00E+00			
TOLUENE-2,6-DIISOCYANATE	91087	0.00E+00			
1,1,2-TRICHLOROETHANE (Vinyl trichloride)	79005	0.00E+00			
TRICHLOROETHYLENE	79016	0.00E+00			
TRIETHYLAMINE	121448	0.00E+00			
URETHANE (Ethyl carbamate)	51796	0.00E+00			
Vanadium Compounds	7440622	0.00E+00			
Vanadium (fume or dust)	7440622	0.00E+00			
VANADIUM PENTOXIDE	1314621	0.00E+00			
VINYL ACETATE	108054	0.00E+00			
VINYL CHLORIDE (Chloroethylene)	75014	0.00E+00			
VINYLIDENE CHLORIDE (1,1-Dichloroethylene)	75354	0.00E+00			
XYLENES (mixed isomers)	1330207	0.00E+00			
m-XYLENE	108383	0.00E+00			
o-XYLENE	95476	0.00E+00			
p-XYLENE	106423	0.00E+00			
TOTAL UNADJUSTED Risk Values			0.120	0.001	1.45E+01

Drop-down Menu
yes
no

Gas Station

Distance (meters)	Distance (feet)	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard
0	0.0	1.000		0.0000
5	16.4	1.000		0.0000
10	32.8	1.000		0.0000
15	49.2	1.000		0.0000
20	65.6	1.000		0.0000
25	82.0	0.728		0.0000
30	98.4	0.559		0.0000
35	114.8	0.445		0.0000
40	131.2	0.365		0.0000
45	147.6	0.305		0.0000
50	164.0	0.260		0.0000
55	180.4	0.225		0.0000
60	196.9	0.197		0.0000
65	213.3	0.174		0.0000
70	229.7	0.155		0.0000
75	246.1	0.139		0.0000
80	262.5	0.126		0.0000
85	278.9	0.114		0.0000
90	295.3	0.104		0.0000
95	311.7	0.096		0.0000
100	328.1	0.088		0.0000
105	344.5	0.082		0.0000
110	360.9	0.076		0.0000
115	377.3	0.071		0.0000
120	393.7	0.066		0.0000
125	410.1	0.062		0.0000
130	426.5	0.058		0.0000
135	442.9	0.055		0.0000
140	459.3	0.052		0.0000
145	475.7	0.049		0.0000
150	492.1	0.046		0.0000
155	508.5	0.044		0.0000
160	524.9	0.042		0.0000
165	541.3	0.040		0.0000
170	557.7	0.038		0.0000
175	574.1	0.036		0.0000
180	590.6	0.034		0.0000
185	607.0	0.033		0.0000
190	623.4	0.031		0.0000
195	639.8	0.030		0.0000
200	656.2	0.029		0.0000
205	672.6	0.028		0.0000
210	689.0	0.027		0.0000
215	705.4	0.026		0.0000
220	721.8	0.025		0.0000
225	738.2	0.024		0.0000
230	754.6	0.023		0.0000
235	771.0	0.022		0.0000
240	787.4	0.022		0.0000
245	803.8	0.021		0.0000
250	820.2	0.020		0.0000
255	836.6	0.020		0.0000
260	853.0	0.019		0.0000
265	869.4	0.018		0.0000
270	885.8	0.018		0.0000
275	902.2	0.017		0.0000
280	918.6	0.017		0.0000
285	935.0	0.016		0.0000
290	951.4	0.016		0.0000
295	967.8	0.015		0.0000
300	984.3	0.015		0.0000

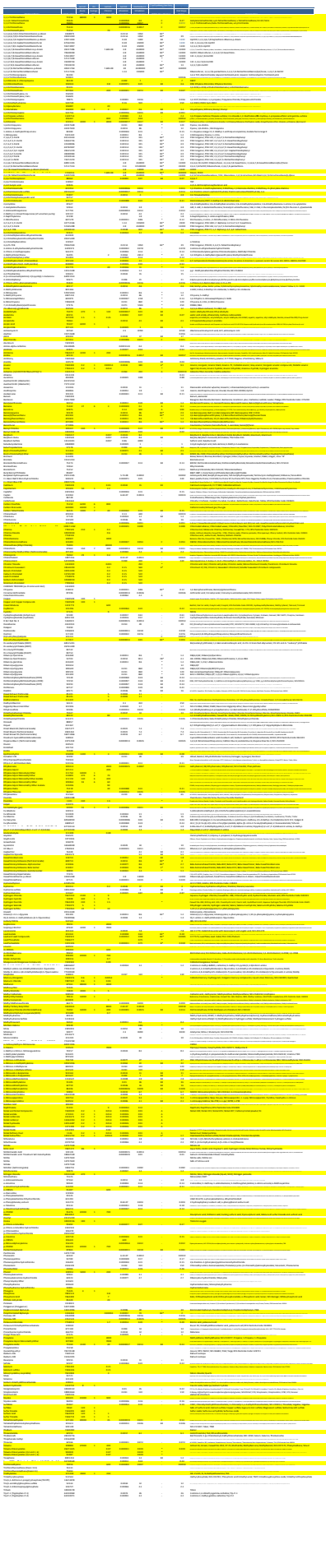
Drop-down Menu
yes
no

Diesel Backup Generator

Distance (meters)	Distance (feet)	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard	Enter PM2.5 Concentration	Adjusted PM2.5 Concentration
0	0.0	1.000		0		0
5	16.4	1.000		0		0
10	32.8	1.000		0		0
15	49.2	1.000		0		0
20	65.6	1.000		0		0
25	82.0	0.85		0		0
30	98.4	0.73		0		0
35	114.8	0.64		0		0
40	131.2	0.58		0		0
50	164.0	0.5		0		0
60	196.9	0.41		0		0
70	229.7	0.31		0		0
80	262.5	0.28		0		0
90	295.3	0.25		0		0
100	328.1	0.22		0		0
110	360.9	0.18		0		0
120	393.7	0.16		0		0
130	426.5	0.15		0		0
140	459.3	0.14		0		0
150	492.1	0.12		0		0
160	524.9	0.1		0		0
180	590.6	0.09		0		0
200	656.2	0.08		0		0
220	721.8	0.07		0		0
240	787.4	0.06		0		0
260	853.0	0.05		0		0
280	918.6	0.04		0		0

Generic Case

Distance (meters)	Distance (feet)	Multiplier
0	0.0	1.000
5	16.4	1.000
10	32.8	0.883
15	49.2	0.855
20	65.6	0.827
25	82.0	0.801
30	98.4	0.775
35	114.8	0.750
40	131.2	0.726
45	147.6	0.702
50	164.0	0.679
55	180.4	0.658
60	196.9	0.636
65	213.3	0.616
70	229.7	0.596
75	246.1	0.577
80	262.5	0.558
85	278.9	0.540
90	295.3	0.523
95	311.7	0.506
100	328.1	0.489
105	344.5	0.474
110	360.9	0.458
115	377.3	0.444
120	393.7	0.429
125	410.1	0.415
130	426.5	0.402
135	442.9	0.389
140	459.3	0.376
145	475.7	0.364
150	492.1	0.353
155	508.5	0.341
160	524.9	0.330
165	541.3	0.319
170	557.7	0.309
175	574.1	0.299
180	590.6	0.290
185	607.0	0.280
190	623.4	0.271
195	639.8	0.262
200	656.2	0.254
205	672.6	0.246
210	689.0	0.238
215	705.4	0.230
220	721.8	0.223
225	738.2	0.216
230	754.6	0.209
235	771.0	0.202
240	787.4	0.195
245	803.8	0.189
250	820.2	0.183
255	836.6	0.177
260	853.0	0.171
265	869.4	0.166
270	885.8	0.160
275	902.2	0.155
280	918.6	0.150
285	935.0	0.145
290	951.4	0.141
295	967.8	0.136
300	984.3	0.132



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

A HEALTHY BREATHING ENVIRONMENT FOR EVERY BAY AREA RESIDENT

BAAQMD Risk and Hazards Emissions Screening Calculator Instructions (Beta Version)

Intention	This calculator is designed to estimate screen-level cancer risk, a non-cancer health hazard index, and PM2.5 concentrations using emissions data from BAAQMD's permitting database. This tool should only be used for permitted facilites where screening-level risks have not already been calculated by BAAQMD or if BAAQMD Health Risk Screening Assessments have not been completed.
Data	BAAQMD staff will provide emissions information for each requested permitted facility. If a facility contains more than one permitted source, BAAQMD staff will provide the plant's total emissions.
Process	The spreadsheet titled "Health Risk Calculator" is the user worksheet for this tool. The tool is based on a five-step process: Step 1: enter facility descriptors, Step 2: enter the emissions data, Step 3: enter distance estimates to adjust the health estimates, Step 4: categorize the facility, and Step 5: read the estimates.

EXAMPLE:

BAY AREA AIR QUALITY MANAGEMENT DISTRICT Printed: DEC 22, 2011
DETAIL POLLUTANTS - ABATED
MOST RECENT P/O APPROVED (2011)

Plant Name: Example 1

S#	SOURCE NAME	MATERIAL THROUGHPUT	SOURCE CODE DATE	POLLUTANT	CODE	LBS/DAY

This plant contains 4 permitted sources that are combined and presented in the plant total:

PLANT TOTAL:

lbs/day	Pollutant		
	Benzene	41	1.26E-03
	Formaldehyde	124	1.04E-04
	Organics (part not specified)	990	6.06E-02
	Arsenic (all)	1030	1.09E-06
	Beryllium (all) pollutant	1040	6.41E-07
	Cadmium	1070	2.73E-06
	Chromium (hexavalent)	1095	5.65E-08
	Lead (all) pollutant	1140	2.32E-06
	Manganese	1160	3.64E-06
	Nickel pollutant	1180	4.42E-05
	Mercury (all) pollutant	1190	7.73E-07
	Diesel Engine Exhaust Part	1350	6.31E-02
	PAHs (non-specified)	1840	5.77E-06
	Nitrous Oxide (N2O)	2030	3.36E-04
	Nitrogen Oxides (part not	2990	3.84E-01
	Sulfur Dioxide (SO2)	3990	4.10E-04
	Carbon Monoxide (CO) pollu	4990	1.92E-01
	Carbon Dioxide, non-biogen	6960	4.20E+01
	Methane (CH4)	6970	1.68E-03

Daily emissions

Pollutant Name	Emission/lbs per day	Cancer Risk
ARSENIC	1.09E-06	5.50E-08
BENZENE	1.26E-03	1.22E-07
BERYLLIUM	6.41E-07	4.98E-09
CADMIUM	2.73E-06	3.79E-08
CHROMIUM	5.65E-08	2.67E-08
DIESEL PM	6.31E-02	6.70E-05
FORMALDEHYDE	1.04E-04	2.11E-09
LEAD	2.32E-06	2.65E-10
NICKEL	4.42E-05	3.73E-08
PAH'S	5.77E-06	5.77E-06
TOTAL:		**7.31E-05**

Using this screening approach, the cancer risk estimate for this facility is 7.31E-05, alternatively expressed as **73 in a million**. If the facility contains only diesel back-up engines, the distance multiplier can be used to adjust the estimated cancer risk.

Note: Not all of the chemicals being emitted by the plant in this example are associated with cancer risk, therefore those chemicals are not included in the cancer risk estimation. Similarly, not all of the chemicals emitted by the plant in this example are associated with acute or chronic hazards.

Plug in the emissions in column B in the remaining tabs in the same fashion to estimate chronic and acute hazards, and PM2.5 concentrations.

Notes: Created 3/22/2019. Version 2.0 Beta. This calculator will create screening level values. More detailed modeling methods will result in more accurate values. For questions and comments contact Areana Flores at aflores@baaqmd.gov.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT Printed: APR 5, 2019

DETAIL POLLUTANTS - ABATED

MOST RECENT P/O APPROVED (2018)

Hunt And Behrens, Inc (P# 1889)

S#	SOURCE NAME / MATERIAL	SOURCE CODE / THROUGHPUT	DATE	POLLUTANT	CODE	LBS/DAY
1	Pellet Mill, Elevator, & Cooler	G1024110	1990	Particulates (part not spe		3.42E+00
2	Pellet Machine, Elevator, & Cooler	G1024110	1990	Particulates (part not spe		5.63E+00
3	Pellet Mill, Elevator, & Cooler	G1024110	1990	Particulates (part not spe		2.60E+00
4	Pellet Mill, Elevator, & Cooler	G1024110	1990	Particulates (part not spe		1.64E+00
5	Floor Pit	G1021110	1990	Particulates (part not spe		5.40E+00
6	Floor Pit	G1021110	1990	Particulates (part not spe		4.46E-01
7	Grinder	G1014110	1990	Particulates (part not spe		9.10E-01
8	Grinder	G1014110	1990	Particulates (part not spe		9.98E-01
9	Rollers, Elevator, & Cooler	G1024110	1990	Particulates (part not spe		1.00E+01
10	Grain Pit (Homemade)	G1021110	1990	Particulates (part not spe		1.88E+00
11	Grain Cleaner	G1022110	1990	Particulates (part not spe		7.42E+01
12	Screw Conveyor (Twin)	G1021110	1990	Particulates (part not spe		2.68E+01
13	Screw Conveyor (Twin)	G1021110	1990	Particulates (part not spe		2.68E-02

14 Grinder
G1014110
Particulates (part not spe 1990 8.43E-01
15 Boiler
C1150189
Benzene 41 5.00E-05
Formaldehyde 124 1.78E-03
Toluene 293 8.09E-05
Organics (other, including 990 9.33E-02
Particulates (part not spe 1990 7.14E-02
Nitrous Oxide (N2O) 2030 5.50E-03
Nitrogen Oxides (part not 2990 3.09E+00
Sulfur Dioxide (SO2) 3990 1.35E-02
Carbon Monoxide (CO) pollu 4990 7.14E-01
Carbon Dioxide, non-biogen 6960 2.91E+03
Methane (CH4) 6970 4.52E-02
16 Truck Pit & Bucket Elevator
G1021110
Particulates (part not spe 1990 2.44E+01
17 Railroad Pit & Bucket Elevator
G1021110
Particulates (part not spe 1990 2.89E+01
18 Truck Pit & Bucket Elevator
G1021110
Particulates (part not spe 1990 2.38E+01
19 Truck Pit & Bucket Elevator
G1021110
Particulates (part not spe 1990 1.34E+01
20 Boiler
C1350189
Benzene 41 1.03E-05
Formaldehyde 124 3.68E-04
Toluene 293 1.67E-05
Organics (other, including 990 3.89E-02
Particulates (part not spe 1990 4.91E-02
Nitrous Oxide (N2O) 2030 1.13E-03
Nitrogen Oxides (part not 2990 4.91E-01
Sulfur Dioxide (SO2) 3990 2.79E-03
Carbon Monoxide (CO) pollu 4990 8.34E-02
Carbon Dioxide, non-biogen 6960 6.01E+02
Methane (CH4) 6970 9.32E-03
21 Boiler
C1150189
Benzene 41 5.00E-05
Formaldehyde 124 1.78E-03
Toluene 293 8.09E-05
Organics (other, including 990 9.33E-02
Particulates (part not spe 1990 7.14E-02
Nitrous Oxide (N2O) 2030 5.50E-03
Nitrogen Oxides (part not 2990 3.09E+00
Sulfur Dioxide (SO2) 3990 1.35E-02

Carbon Monoxide (CO) pollu 4990 7.14E-01
Carbon Dioxide, non-biogen 6960 2.91E+03
Methane (CH4) 6970 4.52E-02

100 Ocean Shore Boiler 22863-76
C1150160
Benzene 41 2.04E-06
Formaldehyde 124 5.73E-07
Organics (other, including 990 1.85E-03
Particulates (part not spe 1990 1.76E-03
Nitrous Oxide (N2O) 2030 1.29E-04
Nitrogen Oxides (part not 2990 7.91E-02
Sulfur Dioxide (SO2) 3990 5.38E-03
Carbon Monoxide (CO) pollu 4990 1.98E-02
Carbon Dioxide, non-biogen 6960 7.92E+01
Methane (CH4) 6970 1.06E-03

PLANT TOTAL:
lbs/day Pollutant

1.12E-04 Benzene (41)
6.51E+03 Carbon Dioxide, non-biogenic CO2 (6960)
1.53E+00 Carbon Monoxide (CO) pollutant (4990)
3.94E-03 Formaldehyde (124)
1.01E-01 Methane (CH4) (6970)
6.76E+00 Nitrogen Oxides (part not spec elsewhere) (2990)
1.23E-02 Nitrous Oxide (N2O) (2030)
2.27E-01 Organics (other, including CH4) (990)
2.26E+02 Particulates (part not spec elsewhere) (1990)
3.52E-02 Sulfur Dioxide (SO2) (3990)
1.78E-04 Toluene (293)

Attachment 4: Construction Health Risk Modeling Calculations

River Bend Crossing, Petaluma, CA

DPM Construction Emissions and Modeling Emission Rates - Unmitigated

Construction Years	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 ($g/s/m^2$)
2019-2020	East Area	0.0198	CON_DPM	39.6	0.01205	1.52E-03	12,196	1.24E-07
		hr/day =	9	(7am - 4pm)				
		days/yr =	365					
		hours/year =	3285					

PM2.5 Fugitive Dust Construction Emissions for Modeling - Unmitigated

Construction Years	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 $g/s/m^2$
2019-2020	East Area	CON_FUG	0.0139	27.7	0.00843	1.06E-03	12,196	8.71E-08
		hr/day =	9	(7am - 4pm)				
		days/yr =	365					
		hours/year =	3285					

River Bend Crossing, Petaluma, CA

Maximum Impacts at Off-Site Residences

Construction Year	Unmitigated: Maximum Concentrations: Exhaust PM2.5/DPM ($\mu g/m^3$)	Unmitigated: Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Unmitigated: Cancer Risk (per million): Child	Unmitigated: Cancer Risk (per million): Adult	Unmitigated: Hazard Index (-)	Unmitigated: Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
2019-2020	0.0553	0.0495	**7.72**	**0.16**	**0.011**	**0.105**

River Bend Crossing, Petaluma, CA - Construction Impacts - Unmitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meters

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

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

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

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

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	0.85	0.85	0.72	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**
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-		
1	1	0 - 1	2019-2020	0.0553	10	7.72	2019-2020	0.0553	1	0.16	0.0495	0.105
2	1	1 - 2	0	0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00		
17	1			0.0000	-	-		0.0000	1	0.00		
.•	.•		.•	.•	.•	.•	.•	.•	.•	.•		
.•	.•		.•	.•	.•	.•	.•	.•	.•	.•		
.•	.•		.•	.•	.•	.•	.•	.•	.•	.•		
65	1			0.0000	-	-		0.0000	1	0.00		
66	1			0.0000	-	-		0.0000	1	0.00		
67	1			0.0000	-	-		0.0000	1	0.00		
68	1			0.0000	-	-		0.0000	1	0.00		
69	1			0.0000	-	-		0.0000	1	0.00		
70	1			0.0000	-	-		0.0000	1	0.00		
Total Increased Cancer Risk						**7.7**				**0.2**		

* Third trimester of pregnancy