TO 20-01 PAPÉ MACHINERY AIR QUALITY & GREENHOUSE GAS EMISSIONS ASSESSMENT

Fremont, California

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Introduction

The purpose of this report is to address air quality and greenhouse gas (GHG) emission impacts associated with the proposed industrial project at 43510 Osgood Road in Fremont, California. 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 were evaluated. This analysis addresses those issues following the guidance provided by the Bay Area Air Quality Management District (BAAQMD).[1]

Project Description

The existing site is currently vacant. The proposed project would construct a two-story, 63,190 square foot (sf) industrial building and 93 parking spaces on the 7.8-acre site. The industrial building would be a construction equipment sales, rental, and service dealership. Repair services, replacement parts sales, and transaction-related financial services would be provided to customers at the proposed Papé facility. The site would be equipped with a vehicle wash station and an above-ground diesel fuel storage tank. Initially, business hours would be Monday through Friday from 7:00 a.m. to 5:00 p.m. Thirty employees are anticipated. Primary site access includes two 40-foot driveways along Osgood Road to allow for tractor-trailer and emergency vehicle access.

The City has adopted "Standard Development Requirements" under the Fremont Municipal Code Section 18.218.050, which include the BAAQMD CEQA Air Quality Guidelines best management practices to control dust during construction projects.

Setting

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

Air Pollutants of Concern

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

Particulate matter is another problematic air pollutant of the Bay Area. Particulate matter is assessed and measured in terms of respirable particulate matter or particles that have a diameter of

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

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

Toxic Air Contaminants

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

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

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The project would include sensitive receptors. The closest sensitive receptors to the project site are the single-family residences to the north and east of the project site opposite Interstate 680 (I-680). There are additional residences at further distances to the west of the site opposite the railroad. In addition to residences, there is a high school (Averroes High School) located to the north of the project site and an elementary school (Stratford School) located to the northeast of the project site.

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

Regulatory Setting

Federal Regulations

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

In the past decade the EPA has established a number of emission standards for on- and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of nitrogen oxides, or NO_X, and particulate matter (PM_{10} and $PM_{2.5}$) and because the EPA has identified diesel particulate matter as a probable carcinogen. Implementation of the heavy-duty diesel on-road vehicle standards and the non-road diesel engine standards are estimated to reduce PM and NO_X emissions from diesel engines up to 95 percent in 2030 when the heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards.[3]

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

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

State Regulations

To address the issue of diesel emissions in the state, CARB developed the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles[4]. In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel

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

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

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

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

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

Bay Area Air Quality Management District (BAAQMD)

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

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

The BAAQMD *California Environmental Quality Act (CEQA) Air Quality Guidelines*[5] were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process consistent with CEQA requirements including thresholds of significance, mitigation measures, and background air quality information. They also include

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

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

Fremont General Plan 2030

The Fremont General Plan 2030 includes goals and policies to reduce exposure of the City's sensitive population to exposure of air pollution, toxic air contaminants, and GHGs. The following goals and policies are applicable to the proposed project:

Goal 7-7: Air Quality. Air quality improved over current conditions that meets or exceeds State and Regional standards.

Policy 7-7.1: Cooperation to Improve Regional Air Quality. Support and coordinate air quality planning efforts with other local, regional and State agencies to improve regional air quality.

Implementation 7-7.1.A: Monitor and Control Air Pollutants. Support BAAQMD efforts to monitor and control air pollutants from stationary and non-stationary sources.

Implementation 7-7.1.B: Permits for Projects that may Impact Air Quality. Require new stationary sources with potential air quality impacts to obtain necessary permits from the BAAQMD.

Implementation 7-7.1.C: Annual Review of Air Quality Data. Monitor available air quality data for the City of Fremont relative to State standards on an annual basis.

Implementation 7-7.1.D: Include Air Quality in Environmental Impact Process. Review proposed projects for their potential to affect air quality conditions during the environmental impact process.

Implementation 7-7.1.E: Clean Air Plan. Review and comment on the Clean Air Plan and other documents prepared by BAAQMD.
Implementation 7-7.1.F: Impacts from Projects in Neighboring Communities. Review environmental impact reports of large projects in neighboring communities with the potential to affect Fremont's air quality and request appropriate mitigations.

Implementation 7-7.1.G: Air Emission Standards. Promote enforcement of air emission standards by BAAQMD.

Policy 7-7.2: Reduce Air Pollution Levels. Reduce City of Fremont air contaminant levels and particulate emissions below BAAQMD attainment levels, in particular, ozone and particulate matter levels.

Implementation 7-7.2.A: Construction Practices. Require construction practices that reduce dust and other particulate emissions and require watering of exposed areas at construction sites.

Implementation 7-7.2.B: Reducing Fireplace Emissions. Ensure new development complies with the City's Wood Burning Fireplace Ordinance to assist in reducing fireplace particulate emissions.

Policy 7-7.3: Land Use Planning to Minimize Health Impacts from Toxic Air Contaminants. Coordinate land use planning with air quality data and local transportation planning to reduce the potential for long-term exposure to TACs from permanent sources that affect the community.

Implementation 7-7.3.A: Limit New TAC Sources. Evaluate new sources of TAC emissions pursuant to BAAQMD guidelines and thresholds for an increased health risk of no more than 10 additional incidents of cancer per million exposures or contribute to a cumulative risk in excess of 100 additional incidents of cancer per million exposures.

Implementation 7-7.3.B: Limit New Residential Development in High Risk Areas. For infill development sites within existing neighborhoods, apply thresholds for review when new sensitive receptors are within areas exposed to health risk levels in excess of 100 additional incidents of cancer per million exposures. Infill development also includes conditional development of a mixed use and urban residential development nature within residential and commercial areas of Centers and Urban Corridors.

When considering land use changes that add sensitive receptor uses outside of existing neighborhoods, apply thresholds for review when new sensitive receptors are within areas exposed to health risk levels in excess of 10 additional incidents of cancer per million exposures.

Implementation 7-7.3.C: Incorporate TAC Controls with New Development. New development projects with sensitive receptors within 1000 feet of a freeway or major TAC source shall assess the TAC health risk for the site and incorporate, to the maximum extent feasible, risk reduction measures to reduce exposure to TAC. Risk reduction measures may include, but not limited to, project phasing, site orientation, distance separations, landscape buffering, building air filtration systems, modified building design or building type, or off-site improvements at a TAC source.

Policy 7-7.4: Air Quality Impact of Industry. Reduce the air quality impacts created by truck traffic, hazardous materials and industry.

Implementation 7-7.4.A: Alternative-Fuel Vehicles. Encourage other agencies and private industry to use alternative-fuel vehicles.

Implementation 7-7.4.B: Enforcement of Air Quality Regulations. Encourage stationary air pollutant sources to reduce emissions, and encourage enforcement by the relevant regulatory agencies when attainment levels are not met.

Implementation 7-7.4.C: Review and Update Hazardous Materials Policy. Enforce City policies and regularly review and update policies on the use, transport and storage of hazardous materials with potential for impacts on air quality and health.

Implementation 7-7.4.D: Review Truck and Train Routes. Review truck and train routes for the potential to affect sensitive receptors in the event of an accident involving hazardous materials.

Goal 7-8: Greenhouse Gas Emissions. Greenhouse gas emissions reduced by 25% from 2005 levels by 2020. This goal is aspirational and not meant to supersede Assembly Bill 32 (AB 32) targets as a standard for project review.

Policy 7-8.1: Climate Action Plan. Maintain a Climate Action Plan (CAP) that outlines the specific strategies the City will implement to achieve its 2020 reduction goals.

Implementation 7-8.1.A: CAP Implementation. Implement strategies in the CAP to achieve the City's greenhouse gas reduction target.

Implementation 7-8.1.B: CAP Updates. Update the CAP every five years to reflect updated GHG emissions data; review the appropriateness and adequacy of the City's GHG reduction target and determine whether revisions to the goals and strategies in the CAP are necessary.

Implementation 7-8.1.C: Consistency with CAP. Review and adjust City policies and programs to be consistent with the Climate Action Plan.

Policy 7-8.2: Development Trends. Review development trends for consistency with targets of AB 32: Global Warming Solutions Act of 2006.

Implementation 7-8.2.A: Report to City Council. Provide a development trend report to the City Council in 2015 to determine consistency with greenhouse gas reduction strategy analysis of the Draft EIR and target reductions of AB 32.
Implementation 7-8.2.B: Monitoring. Monitor actions of the State Scoping Plan and Regional Climate Change planning activities, including SB 375, related to reduction targets for the year 2035 and 2050.

Fremont Municipal Code

The City of Fremont Municipal Code establishes standard development requirements for air quality due to construction activities such as grading and demolition. The following standards are applicant to the analysis:

18.218.050 Standard development requirements: Air Quality

1. Construction Related Emissions. The following construction measures, as periodically amended by BAAQMD, are required for all proposed development projects to reduce construction-related fugitive dust and exhaust emissions:

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

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

   C. 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.
   D. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.

   E. 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.

   F. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five 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.

   G. 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.

   H. A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

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.

For assessing community health risk impacts to new sensitive receptors, the City has developed a significance threshold of 100 incidents of cancer per million per General Plan implementation measure 7-7.3. B, considering the combined impact from existing sources of TACs. This analysis applies the BAAQMD-recommended community risk thresholds for cumulative exposures to the siting of new sensitive receptors.

Table 1. Air Quality Significance Thresholds

Criteria Air Pollutant	**Construction Thresholds**	**Operational Thresholds**	
	Average Daily Emissions (lbs./day)	**Average Daily Emissions (lbs./day)**	**Annual Average Emissions (tons/year)**
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (Exhaust)	82	15
$PM_{2.5}$	54 (Exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not Applicable	
Health Risks and Hazards	**Single Sources Within 1,000-foot Zone of Influence**	**Combined Sources (Cumulative from all sources within 1,000-foot zone of influence)**	
Project Emissions			
Excess Cancer Risk	>10 per one million	>100 per one million*	
Hazard Index	>1.0	>10.0*	
Incremental annual $PM_{2.5}$	>0.3 µg/m^3	>0.8 µg/m^{3*}	
		Cumulative threshold not applied if project impacts not cumulatively considerable.	
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.			

IMPACTS AND MITIGATION MEASURES

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

The most recent clean air plan is the *Bay Area 2017 Clean Air Plan*[6] that was adopted by BAAQMD in April 2017. The Plan includes control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. The proposed project would not conflict with the latest Clean Air planning efforts since 1) the project would have emissions below the BAAQMD thresholds (see Impact below), 2) the project would be considered urban infill, 3) the project would be located near employment centers, and 4) the project would be located near transit with regional connections.

Impact: 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?

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 and estimates emissions for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. A construction build-out scenario, including equipment list and schedule, was based on information provided by the project applicant. The proposed project land uses were input into CalEEMod, which included:

- 63,190-sf and 7.8 acres entered as “Industrial Park”,
- 93 parking spaces and 18,213-sf entered as “Parking Lot”,
- 315 tons of pavement demolition and hauling,
- 500 one-way cement truck trips during building construction, and
- 74 one-way asphalt truck trips during paving.

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

Construction was assumed to begin January 2020 and last 15 months. There were an estimated 320 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)	0.7 tons	3.5 tons	0.2 tons	0.2 tons
Average daily emissions (pounds)[1]	4.4 lbs./day	21.8 lbs./day	1.1 lbs./day	1.1 lbs./day
BAAQMD Thresholds (pounds per day)	*54* lbs./day	*54* lbs./day	*82* lbs./day	*54* lbs./day
Exceed Threshold?	No	No	No	No
Notes: [1]Assumes 320 workdays.				

Construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. The City has adopted "Standard Development Requirements" under the Fremont Municipal Code Section 18.218.050, which include the BAAQMD CEQA Air Quality Guidelines best management practices to control dust during construction projects. *The project would have to implement these practices during construction activities.*

Operational Period Emissions

Operational air emissions from the project would be generated primarily from traffic, truck deliveries, and some on-site operation of construction equipment. There would be emissions from architectural coatings and maintenance products (classified as consumer products) are typical emissions from these types of uses. CalEEMod was used to estimate emissions from operation of the proposed project assuming full build-out.

Land Uses

The project land uses described above for the construction period modeling were used.

Model Year

Emissions associated with vehicle travel depend on the year of analysis because emission control technology requirements are phased-in over time. Therefore, the earlier the year analyzed in the model, the higher the emission rates utilized by CalEEMod. The earliest the project could possibly be constructed and begin operating would be 2022. Emissions associated with build-out later than 2022 would be lower.

Trip Generation Rates

The trip generation rates, trip types, and travel distances were based on the CalEEMod default assumptions for the project land use.

Energy

CalEEMod defaults for energy use were used, which include the 2016 Title 24 Building Standards. Indirect emissions from electricity were computed in CalEEMod. The model has a default rate of 641.3 pounds of CO_2 per megawatt of electricity produced, which is based on PG&E's 2008 emissions rate. The rate was adjusted to account for PG&E's projected 2020 CO_2 intensity rate. This 2020 rate is based, in part, on the requirement of a renewable energy portfolio standard of 33 percent by the year 2020. The derived 2020 rate for PG&E was estimated at 290 pounds of CO_2 per megawatt of electricity delivered.[7]

Other CalEEMod Inputs

Default model assumptions for emissions associated with solid waste generation use were applied to the project. Water/wastewater use were changed to 100% aerobic conditions to represent wastewater treatment plant conditions. There is no development or land uses currently on the project site; therefore, the existing land uses emissions would not exist.

On-Site Equipment

The project would include the intermittent operation of construction equipment. Equipment would be operated on-site for short periods of time when loading or unloading equipment from trucks or moving equipment in the yard. Papé's Rohnert Park facility was visited along with a Papé representative to observe this activity. The facility services mostly new construction equipment, which would meet U.S. EPA Tier 4 engines standards. Discussions with Papé personnel, which were consistent with our observations indicate most equipment is Tier 4 and there are some Tier 3 and occasionally older equipment. About 15 pieces of equipment operate for an average of 15 minutes each. The applicant provided a spreadsheet of equipment and we identified the size and approximate year, which were all considered Tier 4. The CARB *Off-Road Calculator Tool* was used to compute emissions from the equipment, broken down by horsepower class. An average load factor of 0.4 was applied. The calculator uses horsepower, model year, calendar year, annual activity, accumulated hours on equipment (assumed to be 1,000 hours/year) and load factor (average computed at 0.4).

Computed Emissions

As shown in Table 3, operational emissions would not exceed the BAAQMD significance thresholds.

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

Table 3. Operational Emissions

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
2022 Project Operational Emissions (*tons/year*)				
From CalEEMod	0.4 tons	0.7 tons	0.3 tons	0.1 tons
On-site equipment operation	<0.1 tons	0.1 tons	0.0 tons	0.0 tons
total	*0.4 tons*	*0.8 tons*	*0.3 tons*	*0.1 tons*
BAAQMD Thresholds (tons /year)	*10 tons*	*10 tons*	*15 tons*	*10 tons*
Exceed Threshold?	No	No	No	No
Average Daily Operational Emissions (*lbs/day*)[1]	2.2 lbs.	4.4 lbs.	1.6 lbs.	0.5 lbs.
BAAQMD Thresholds (pounds/day)	*54* lbs.	*54* lbs.	*82* lbs.	*54* lbs.
Exceed Threshold?	No	No	No	No

Notes: [1] Assumes 365-day operation.

Impact: Expose sensitive receptors to substantial pollutant concentrations?

Project impacts related to increased community risk would occur by introducing a new source of TACs during construction and operation with the potential to adversely affect existing sensitive receptors in the project vicinity.

Temporary project construction activity would generate dust and equipment exhaust on a temporary basis that could affect nearby sensitive receptors. During operation, there would be daily equipment operation and truck trips to and from the project site. A health risk assessment was prepared to address both project construction and operational impacts on the surrounding off-site sensitive receptors. Community risk impacts are addressed by predicting increased lifetime cancer risk, the increase in annual $PM_{2.5}$ concentrations, and computing the Hazard Index (HI) for non-cancer health risks. The methodology for computing community risks impacts is contained in *Attachment 1*.

Construction Community Health Risk Impacts

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 $PM_{2.5}$.[8] 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.

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

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 0.1813 tons (363 pounds). The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. 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 0.0993 tons (199 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA ISCST3 dispersion model was used to predict concentrations of DPM and $PM_{2.5}$ concentrations at existing sensitive receptors in the vicinity of the project construction area. The ISCST3 dispersion model is a BAAQMD-recommended model for use in modeling these types of emission activities for CEQA projects.[9] Emission sources for the construction site were grouped into two categories, exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions. The ISCST3 modeling utilized two area sources to represent the on-site construction emissions, one area source for DPM exhaust emissions and one area source for fugitive $PM_{2.5}$ dust emissions. For the exhaust emissions from construction equipment, an emission release height of 6 meters (20 feet) was used for the area sources. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases. For modeling fugitive $PM_{2.5}$ emissions, a near-ground level release height of 2 meters (6.6 feet) was used for the area sources. Emissions from vehicle travel around the project site were included in the modeled area sources. Construction emissions were modeled as occurring daily between 7:00 a.m. and 7:00 p.m., when the majority of the construction activity involving equipment usage would occur.

The modeling used a five-year data set (1990-1994) of hourly meteorological data for Fremont that was prepared by the BAAQMD for use with the ISCST3 model. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2020-2021 construction period were calculated using the model. DPM and $PM_{2.5}$ concentrations were calculated at nearby residential and school receptors at a receptor height of 1.5 meters (4.9 feet) to represent the first floor of nearby single-family homes and high school.

Construction Impacts

The maximum-modeled annual DPM and $PM_{2.5}$ concentrations, which includes both the DPM and fugitive $PM_{2.5}$ concentrations, were identified at nearby sensitive receptors (as shown in Figure 1) for the maximally exposed individuals (MEIs). Using the maximum annual modeled DPM concentrations, the maximum increased cancer risks were calculated using BAAQMD recommended methods and exposure parameters described in *Attachment 1*. Non-cancer health hazards and maximum $PM_{2.5}$ concentrations were also calculated and identified. *Attachment 3* to

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

this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

Results of this assessment indicated that the MEI was located on the first floor (1.5 meters) of the single-family residence to the north of the project site, as indicated in Figure 1. The maximum increased cancer risks were adjusted using infant/child exposure parameters. Results of this assessment indicated that the maximum cancer risks would be 4.9 per million for infant/child exposure. The maximum-modeled annual $PM_{2.5}$ concentration, which is based on combined exhausted and fugitive dust emissions, would be 0.04 µg/m^3 and the HI, based on the DPM concentration, would be 0.01.

Additionally, modeling was conducted to predict the cancer risks, non-cancer health hazards, and maximum $PM_{2.5}$ concentrations associated with students at the high school to the north and the elementary school to the northeast of the project site. The maximum increased cancer risks were adjusted using child exposure parameters. Results of this assessment indicated that the student MEI would be at the high school, and the maximum cancer risks would be 1.0 per million for child exposure. The maximum-modeled annual $PM_{2.5}$ concentration, which is based on combined exhausted and fugitive dust emissions, would be 0.03 µg/m^3 and the HI, based on the DPM concentration, would be less than 0.01.

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

Operational Community Risk Impacts

On-site equipment emissions predicted using the CARB *Off-Road Calculator*, along with on- and near-site truck traffic, were also used in the dispersion modeling as described above. Traffic emissions were computed using the CT-Emfac2017 model. This model assumed two-mile trip lengths of using the medium and heavy-heavy duty truck category. There would be 18 truck trips per day generated by the project.

The same dispersion model and receptor set for the construction modeling were used for modeling operational emissions. This included one area source for DPM exhaust emissions. For the exhaust emissions from construction equipment and truck traffic, an emission release height of 6 meters (20 feet) was used.

Combined Impact

Table 4 reports the project at the sensitive receptors most affected by the project (i.e. the MEI). The project's community risk from project construction and operation do not exceed the BAAQMD single-source significance threshold for annual cancer risk, $PM_{2.5}$ concentration, or HI.

Table 4. Impacts from Combined Sources at Off-Site MEI

Source		Cancer Risk (per million)	Annual $PM_{2.5}$ ($\mu g/m^3$)	Hazard Index
Project Construction + Operation	Unmitigated	5.0 (infant)	0.04	0.01
	Mitigated*	0.4 (infant)	0.01	<0.01
BAAQMD Single-Source Threshold		***>10.0***	***>0.3***	***>1.0***
Exceed Threshold?	Unmitigated	*No*	*No*	*No*
	Mitigated*	*No*	*No*	*No*

* Construction equipment engines with Tier 4 Interim Mitigation Measures.

Mitigation Measure AQ-1: **Selection of equipment during construction to minimize emissions. Such equipment selection would include the following:**

The project shall develop a plan demonstrating that the off-road equipment used onsite to construct the project would achieve a fleet-wide average 80-percent reduction in DPM exhaust emissions or greater. One feasible plan to achieve this reduction would include the following:

- All diesel-powered off-road equipment, larger than 25 horsepower, operating on the site for more than two days continuously shall, at a minimum, meet U.S. EPA particulate matter emissions standards for Tier 4 Interim engines or equivalent. Where equipment meeting Tier 4 standards are not available, the equipment will be required to include Tier 3 engines with CARB-certified Level 3 Diesel Particulate Filters[10] that are considered CARB verified diesel emission control devices (VDECs). Alternatively, the use of equipment that includes electric or alternatively-fueled equipment (i.e., non-diesel) would meet this requirement.

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

Effectiveness of Mitigation Measure AQ-1

Implementation of *Mitigation Measure AQ-1* using Tier 4 Interim would reduce on-site diesel exhaust emissions from construction equipment by 93 percent. With mitigation, the computed maximum increased lifetime residential cancer risk from construction at the MEI location, assuming infant exposure, would be 0.4 in one million or less and the increase in annual PM2.5 concentrations would be 0.01µg/m^3. The health risk impacts would be negligible with this mitigation measure and not contribute considerably to a cumulatively significant impact.

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

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

Greenhouse Gas Emissions

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

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

Significance Thresholds

The City of Fremont has a Climate Action Plan (CAP), adopted in November 2012,[11] that established the goal and measures to reduce greenhouse gas emissions 25% below 2005 levels by 2020. However, the CAP does not have a specific metric ton GHG threshold for project-level construction or operation.

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.

[11] City of Fremont, 2012. *City of Sunnyvale Climate Action Plan*. November.

Although BAAQMD has not published a quantified threshold for 2030 yet, this assessment uses a "Substantial Progress" efficiency metric of 2.8 MT CO_2e/year/service population and a bright-line threshold of 660 MT CO_{2e}/year based on the GHG reduction goals of EO B-30-15. The service population metric of 2.8 is calculated for 2030 based on the 1990 inventory and the projected 2030 statewide population and employment levels.[12] The 2030 bright-line threshold is a 40 percent reduction of the 2020 1,100 MT CO_{2e}/year threshold.

CalEEMod Modeling

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

Onsite Equipment Operation

The project would include some operation of construction equipment at the site. These emissions were computed using the CARB OffRoad emission calculator.

Construction Emissions

GHG emissions associated with construction were computed to be 308 MT of CO_2e for the total construction period. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the City nor BAAQMD have an adopted threshold of significance for construction-related GHG emissions, though BAAQMD recommends quantifying emissions and disclosing that GHG emissions would occur during construction. BAAQMD also encourages the incorporation of best management practices to reduce GHG emissions during construction where feasible and applicable.

Operational Emissions

The CalEEMod model, along with the project on-site equipment usage, was used to estimate daily emissions associated with operation of the fully-developed site under the proposed project. As shown in Table 5, annual emissions resulting from operation of the proposed project are predicted to be 654 MT of CO_2e for the year 2022 and 590 MT of CO_{2e} for the year 2030. Emissions for 2030 do not exceed the 2030 "Substantial Progress" threshold of 660 MT of CO_{2e}/yr.

[12] Bay Area Air Quality Management District, 2016. *CLE International 12th Annual Super-Conference CEQA Guidelines, Case Law and Policy Update*. December.

Table 5. Annual Project GHG Emissions (CO_2e) in Metric Tons

Source Category	Proposed Project in 2022	Proposed Project in 2030
Area	0	5
Energy Consumption	171	171
Mobile	391	327
Solid Waste Generation	39	39
Water Usage	30	30
On-site Equipment Operation	23	23
Total	654	590
Significance Threshold		***660 MT CO_2e/yr***
Exceeds thresholds?	*No*	*No*

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

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

A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State of California's main strategies to reduce GHGs from business-as-usual (BAU) emissions projected in 2020 back down to 1990 levels. BAU is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. It required CARB and other state agencies to develop and adopt regulations and other initiatives reducing GHGs by 2012.

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

SB 32 was passed in 2016, which codified a 2030 GHG emissions reduction target of 40 percent below 1990 levels. CARB is currently working on a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The proposed Scoping Plan Update was published on January 20, 2017 as directed by SB 32 companion legislation AB

197. The mid-term 2030 target is considered critical by CARB on the path to obtaining an even deeper GHG emissions target of 80 percent below 1990 levels by 2050, as directed in Executive Order S-3-05. The Scoping Plan outlines the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure, providing a blueprint to continue driving down GHG emissions and obtain the statewide goals.

The proposed project would not conflict or otherwise interfere with the statewide GHG reduction measures identified in CARB's Scoping Plan. For example, proposed buildings would be constructed in conformance with CALGreen and the Title 24 Building Code, which requires high-efficiency water fixtures and water-efficient irrigation systems. The project would also be subject to local policies that may affect emissions of greenhouse gases.

Supporting Documentation

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

Attachment 2 includes the CalEEMod output for project construction and operational criteria air pollutant and GHG emissions along with on-site equipment and truck traffic modeling. The operational outputs for 2030 uses are also included in this attachment. Also included are any modeling assumptions.

Attachment 3 is the construction health risk assessment. ISCST3 dispersion modeling files for this assessment, which are quite voluminous, are available upon request and would be provided in digital format.

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.[13] 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.[14] 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.[15] 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

[13] 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.
[14] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
[15] 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: CalEEMod Modeling Inputs and Outputs

Pape Machinery - Fremont

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	63.19	1000sqft	7.80	63,190.00	0
Parking Lot	93.00	Space	0.00	18,213.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2022
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 Rate for 2020

Land Use - From Data Request sheet

Construction Phase - Construction worksheet

Off-road Equipment - Add aerial lift

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - added trenching equipment

Trips and VMT - add 500 cement truck trips, 74 asphalt trip at vendor distance

Demolition - Construction worksheet

Grading - Construction worksheet

Energy Use -

Construction Off-road Equipment Mitigation - Tier 4 equipment and BMPs

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim

tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblGrading	AcresOfGrading	0.00	10.00
tblLandUse	LandUseSquareFeet	37,200.00	18,213.00
tblLandUse	LotAcreage	1.45	7.80
tblLandUse	LotAcreage	0.84	0.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	7.30
tblTripsAndVMT	HaulingTripLength	20.00	7.30
tblTripsAndVMT	HaulingTripNumber	0.00	500.00
tblTripsAndVMT	HaulingTripNumber	0.00	74.00

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					
2020	0.3273	3.1024	2.4745	4.6000e-003	0.2073	0.1623	0.3696	0.0960	0.1519	0.2479	0.0000	403.5822	403.5822	0.0892	0.0000	405.8122
2021	0.3800	0.3924	0.4086	7.8000e-004	0.0123	0.0190	0.0312	3.2600e-003	0.0179	0.0212	0.0000	65.9202	65.9202	0.0134	0.0000	66.2543
Maximum	**0.3800**	**3.1024**	**2.4745**	**4.6000e-003**	**0.2073**	**0.1623**	**0.3696**	**0.0960**	**0.1519**	**0.2479**	**0.0000**	**403.5822**	**403.5822**	**0.0892**	**0.0000**	**405.8122**

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					
2020	0.0927	1.7083	2.6562	4.6000e-003	0.1168	0.0116	0.1284	0.0496	0.0115	0.0611	0.0000	403.5818	403.5818	0.0892	0.0000	405.8118
2021	0.3470	0.2406	0.3962	7.8000e-004	0.0123	1.5800e-003	0.0139	3.2600e-003	1.5700e-003	4.8300e-003	0.0000	65.9201	65.9201	0.0134	0.0000	66.2543
Maximum	**0.3470**	**1.7083**	**2.6562**	**4.6000e-003**	**0.1168**	**0.0116**	**0.1284**	**0.0496**	**0.0115**	**0.0611**	**0.0000**	**403.5818**	**403.5818**	**0.0892**	**0.0000**	**405.8118**

	ROG	NOx	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	**37.84**	**44.23**	**-5.87**	**0.00**	**41.21**	**92.73**	**64.51**	**46.76**	**92.28**	**75.49**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2020**	**3-31-2020**	1.1191	0.4616
2	**4-1-2020**	**6-30-2020**	0.7617	0.4413
3	**7-1-2020**	**9-30-2020**	0.7701	0.4461
4	**10-1-2020**	**12-31-2020**	0.7715	0.4475
5	**1-1-2021**	**3-31-2021**	0.7791	0.5921
		Highest	1.1191	0.5921

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	0.2814	1.0000e-005	1.4400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Energy	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	169.7558	169.7558	0.0117	3.3600e-003	171.0493
Mobile	0.0952	0.6536	1.0810	4.2300e-003	0.3308	4.0200e-003	0.3348	0.0889	3.7700e-003	0.0927	0.0000	390.1187	390.1187	0.0161	0.0000	390.5221
Waste						0.0000	0.0000		0.0000	0.0000	15.9064	0.0000	15.9064	0.9400	0.0000	39.4074
Water						0.0000	0.0000		0.0000	0.0000	4.6359	10.4009	15.0368	0.4772	0.0115	30.3813
Total	**0.3832**	**0.7135**	**1.1327**	**4.5900e-003**	**0.3308**	**8.5800e-003**	**0.3394**	**0.0889**	**8.3300e-003**	**0.0973**	**20.5423**	**570.2782**	**590.8205**	**1.4451**	**0.0148**	**631.3629**

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	0.2814	1.0000e-005	1.4400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Energy	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	169.7558	169.7558	0.0117	3.3600e-003	171.0493
Mobile	0.0952	0.6536	1.0810	4.2300e-003	0.3308	4.0200e-003	0.3348	0.0889	3.7700e-003	0.0927	0.0000	390.1187	390.1187	0.0161	0.0000	390.5221
Waste						0.0000	0.0000		0.0000	0.0000	15.9064	0.0000	15.9064	0.9400	0.0000	39.4074
Water						0.0000	0.0000		0.0000	0.0000	4.6359	10.4009	15.0368	0.4772	0.0115	30.3813
Total	**0.3832**	**0.7135**	**1.1327**	**4.5900e-003**	**0.3308**	**8.5800e-003**	**0.3394**	**0.0889**	**8.3300e-003**	**0.0973**	**20.5423**	**570.2782**	**590.8205**	**1.4451**	**0.0148**	**631.3629**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/28/2020	5	20	
2	Site Preparation	Site Preparation	1/29/2020	2/11/2020	5	10	
3	Grading	Grading	2/12/2020	3/10/2020	5	20	
4	Trenching	Trenching	2/19/2020	3/17/2020	5	20	
5	Building Construction	Building Construction	3/11/2020	1/26/2021	5	230	
6	Paving	Paving	1/27/2021	2/23/2021	5	20	
7	Architectural Coating	Architectural Coating	2/24/2021	3/23/2021	5	20	

Acres of Grading (Site Preparation Phase): 10

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 94,785; Non-Residential Outdoor: 31,595; Striped Parking Area:

OffRoad Equipment

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

Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	6.00	63	0.31
Architectural Coating	Air Compressors	1	6.00	78	0.48
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Cement and Mortar Mixers	30	4.50	9	0.56

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	31.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	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	9	34.00	13.00	500.00	10.80	7.30	7.30	LD_Mix	HDT_Mix	HHDT
Architectural Coating	2	7.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	36	90.00	0.00	74.00	10.80	7.30	7.30	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 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					
Fugitive Dust					3.3700e-003	0.0000	3.3700e-003	5.1000e-004	0.0000	5.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0331	0.3320	0.2175	3.9000e-004		0.0166	0.0166		0.0154	0.0154	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2386
Total	**0.0331**	**0.3320**	**0.2175**	**3.9000e-004**	**3.3700e-003**	**0.0166**	**0.0200**	**5.1000e-004**	**0.0154**	**0.0159**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2386**

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	1.3000e-004	4.5200e-003	7.9000e-004	1.0000e-005	2.6000e-004	1.0000e-005	2.8000e-004	7.0000e-005	1.0000e-005	9.0000e-005	0.0000	1.1867	1.1867	6.0000e-005	0.0000	1.1882
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	5.2000e-004	3.8000e-004	3.9200e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0543	1.0543	3.0000e-005	0.0000	1.0550
Total	**6.5000e-004**	**4.9000e-003**	**4.7100e-003**	**2.0000e-005**	**1.4500e-003**	**2.0000e-005**	**1.4700e-003**	**3.9000e-004**	**2.0000e-005**	**4.1000e-004**	**0.0000**	**2.2410**	**2.2410**	**9.0000e-005**	**0.0000**	**2.2432**

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					1.5200e-003	0.0000	1.5200e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.8400e-003	0.1356	0.2467	3.9000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2385
Total	**5.8400e-003**	**0.1356**	**0.2467**	**3.9000e-004**	**1.5200e-003**	**6.2000e-004**	**2.1400e-003**	**2.3000e-004**	**6.2000e-004**	**8.5000e-004**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2385**

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	1.3000e-004	4.5200e-003	7.9000e-004	1.0000e-005	2.6000e-004	1.0000e-005	2.8000e-004	7.0000e-005	1.0000e-005	9.0000e-005	0.0000	1.1867	1.1867	6.0000e-005	0.0000	1.1882
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	5.2000e-004	3.8000e-004	3.9200e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0543	1.0543	3.0000e-005	0.0000	1.0550
Total	**6.5000e-004**	**4.9000e-003**	**4.7100e-003**	**2.0000e-005**	**1.4500e-003**	**2.0000e-005**	**1.4700e-003**	**3.9000e-004**	**2.0000e-005**	**4.1000e-004**	**0.0000**	**2.2410**	**2.2410**	**9.0000e-005**	**0.0000**	**2.2432**

3.3 Site Preparation - 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					

Fugitive Dust					0.0956	0.0000	0.0956	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0956**	**0.0110**	**0.1066**	**0.0502**	**0.0101**	**0.0603**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

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	3.1000e-004	2.3000e-004	2.3500e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6326	0.6326	2.0000e-005	0.0000	0.6330
Total	**3.1000e-004**	**2.3000e-004**	**2.3500e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6326**	**0.6326**	**2.0000e-005**	**0.0000**	**0.6330**

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					0.0430	0.0000	0.0430	0.0226	0.0000	0.0226	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.4800e-003	0.0608	0.1148	1.9000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**3.4800e-003**	**0.0608**	**0.1148**	**1.9000e-004**	**0.0430**	**3.1000e-004**	**0.0434**	**0.0226**	**3.1000e-004**	**0.0229**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

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	3.1000e-004	2.3000e-004	2.3500e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6326	0.6326	2.0000e-005	0.0000	0.6330
Total	**3.1000e-004**	**2.3000e-004**	**2.3500e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6326**	**0.6326**	**2.0000e-005**	**0.0000**	**0.6330**

3.4 Grading - 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					
Fugitive Dust					0.0655	0.0000	0.0655	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0243	0.2639	0.1605	3.0000e-004		0.0127	0.0127		0.0117	0.0117	0.0000	26.0588	26.0588	8.4300e-003	0.0000	26.2694
Total	**0.0243**	**0.2639**	**0.1605**	**3.0000e-004**	**0.0655**	**0.0127**	**0.0783**	**0.0337**	**0.0117**	**0.0454**	**0.0000**	**26.0588**	**26.0588**	**8.4300e-003**	**0.0000**	**26.2694**

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	5.2000e-004	3.8000e-004	3.9200e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0543	1.0543	3.0000e-005	0.0000	1.0550
Total	**5.2000e-004**	**3.8000e-004**	**3.9200e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0543**	**1.0543**	**3.0000e-005**	**0.0000**	**1.0550**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0295	0.0000	0.0295	0.0152	0.0000	0.0152	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2000e-003	0.1033	0.1899	3.0000e-004		4.8000e-004	4.8000e-004		4.8000e-004	4.8000e-004	0.0000	26.0587	26.0587	8.4300e-003	0.0000	26.2694
Total	**5.2000e-003**	**0.1033**	**0.1899**	**3.0000e-004**	**0.0295**	**4.8000e-004**	**0.0300**	**0.0152**	**4.8000e-004**	**0.0156**	**0.0000**	**26.0587**	**26.0587**	**8.4300e-003**	**0.0000**	**26.2694**

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	5.2000e-004	3.8000e-004	3.9200e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0543	1.0543	3.0000e-005	0.0000	1.0550

Total	**5.2000e-004**	**3.8000e-004**	**3.9200e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0543**	**1.0543**	**3.0000e-005**	**0.0000**	**1.0550**

3.5 Trenching - 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	4.5400e-003	0.0452	0.0555	8.0000e-005		2.5000e-003	2.5000e-003		2.3000e-003	2.3000e-003	0.0000	7.2655	7.2655	2.3500e-003	0.0000	7.3243
Total	**4.5400e-003**	**0.0452**	**0.0555**	**8.0000e-005**		**2.5000e-003**	**2.5000e-003**		**2.3000e-003**	**2.3000e-003**	**0.0000**	**7.2655**	**7.2655**	**2.3500e-003**	**0.0000**	**7.3243**

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	1.7000e-004	1.3000e-004	1.3100e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3514	0.3514	1.0000e-005	0.0000	0.3517
Total	**1.7000e-004**	**1.3000e-004**	**1.3100e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3514**	**0.3514**	**1.0000e-005**	**0.0000**	**0.3517**

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	1.3300e-003	0.0363	0.0626	8.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	7.2655	7.2655	2.3500e-003	0.0000	7.3243
Total	**1.3300e-003**	**0.0363**	**0.0626**	**8.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**7.2655**	**7.2655**	**2.3500e-003**	**0.0000**	**7.3243**

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	1.7000e-004	1.3000e-004	1.3100e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3514	0.3514	1.0000e-005	0.0000	0.3517
Total	**1.7000e-004**	**1.3000e-004**	**1.3100e-003**	**0.0000**	**4.0000e-004**	**0.0000**	**4.0000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3514**	**0.3514**	**1.0000e-005**	**0.0000**	**0.3517**

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	0.2247	2.0337	1.7859	2.8500e-003		0.1184	0.1184		0.1113	0.1113	0.0000	245.5066	245.5066	0.0599	0.0000	247.0040
Total	**0.2247**	**2.0337**	**1.7859**	**2.8500e-003**		**0.1184**	**0.1184**		**0.1113**	**0.1113**	**0.0000**	**245.5066**	**245.5066**	**0.0599**	**0.0000**	**247.0040**

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	9.8000e-004	0.0387	5.9900e-003	8.0000e-005	1.5200e-003	9.0000e-005	1.6000e-003	4.2000e-004	8.0000e-005	5.0000e-004	0.0000	7.9777	7.9777	6.3000e-004	0.0000	7.9935
Vendor	5.1700e-003	0.1620	0.0349	3.8000e-004	9.0500e-003	7.5000e-004	9.8000e-003	2.6200e-003	7.2000e-004	3.3400e-003	0.0000	36.4495	36.4495	2.1000e-003	0.0000	36.5019
Worker	0.0125	9.2000e-003	0.0943	2.8000e-004	0.0285	2.0000e-004	0.0287	7.5800e-003	1.8000e-004	7.7600e-003	0.0000	25.3309	25.3309	6.5000e-004	0.0000	25.3473
Total	**0.0186**	**0.2099**	**0.1352**	**7.4000e-004**	**0.0391**	**1.0400e-003**	**0.0401**	**0.0106**	**9.8000e-004**	**0.0116**	**0.0000**	**69.7581**	**69.7581**	**3.3800e-003**	**0.0000**	**69.8427**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0566	1.1567	1.8946	2.8500e-003		8.9700e-003	8.9700e-003		8.9700e-003	8.9700e-003	0.0000	245.5063	245.5063	0.0599	0.0000	247.0037
Total	**0.0566**	**1.1567**	**1.8946**	**2.8500e-003**		**8.9700e-003**	**8.9700e-003**		**8.9700e-003**	**8.9700e-003**	**0.0000**	**245.5063**	**245.5063**	**0.0599**	**0.0000**	**247.0037**

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	9.8000e-004	0.0387	5.9900e-003	8.0000e-005	1.5200e-003	9.0000e-005	1.6000e-003	4.2000e-004	8.0000e-005	5.0000e-004	0.0000	7.9777	7.9777	6.3000e-004	0.0000	7.9935
Vendor	5.1700e-003	0.1620	0.0349	3.8000e-004	9.0500e-003	7.5000e-004	9.8000e-003	2.6200e-003	7.2000e-004	3.3400e-003	0.0000	36.4495	36.4495	2.1000e-003	0.0000	36.5019
Worker	0.0125	9.2000e-003	0.0943	2.8000e-004	0.0285	2.0000e-004	0.0287	7.5800e-003	1.8000e-004	7.7600e-003	0.0000	25.3309	25.3309	6.5000e-004	0.0000	25.3473
Total	**0.0186**	**0.2099**	**0.1352**	**7.4000e-004**	**0.0391**	**1.0400e-003**	**0.0401**	**0.0106**	**9.8000e-004**	**0.0116**	**0.0000**	**69.7581**	**69.7581**	**3.3800e-003**	**0.0000**	**69.8427**

3.6 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0171	0.1569	0.1492	2.4000e-004		8.6300e-003	8.6300e-003		8.1100e-003	8.1100e-003	0.0000	20.8474	20.8474	5.0300e-003	0.0000	20.9731
Total	**0.0171**	**0.1569**	**0.1492**	**2.4000e-004**		**8.6300e-003**	**8.6300e-003**		**8.1100e-003**	**8.1100e-003**	**0.0000**	**20.8474**	**20.8474**	**5.0300e-003**	**0.0000**	**20.9731**

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	8.0000e-005	3.0900e-003	4.9000e-004	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.6689	0.6689	5.0000e-005	0.0000	0.6702
Vendor	3.6000e-004	0.0125	2.6500e-003	3.0000e-005	7.7000e-004	3.0000e-005	7.9000e-004	2.2000e-004	2.0000e-005	2.5000e-004	0.0000	3.0651	3.0651	1.7000e-004	0.0000	3.0693
Worker	9.8000e-004	7.0000e-004	7.2900e-003	2.0000e-005	2.4200e-003	2.0000e-005	2.4400e-003	6.4000e-004	1.0000e-005	6.6000e-004	0.0000	2.0761	2.0761	5.0000e-005	0.0000	2.0774
Total	**1.4200e-003**	**0.0163**	**0.0104**	**6.0000e-005**	**4.3800e-003**	**6.0000e-005**	**4.4200e-003**	**1.1500e-003**	**4.0000e-005**	**1.2100e-003**	**0.0000**	**5.8101**	**5.8101**	**2.7000e-004**	**0.0000**	**5.8168**

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	4.8000e-003	0.0982	0.1609	2.4000e-004		7.6000e-004	7.6000e-004		7.6000e-004	7.6000e-004	0.0000	20.8473	20.8473	5.0300e-003	0.0000	20.9731
Total	**4.8000e-003**	**0.0982**	**0.1609**	**2.4000e-004**		**7.6000e-004**	**7.6000e-004**		**7.6000e-004**	**7.6000e-004**	**0.0000**	**20.8473**	**20.8473**	**5.0300e-003**	**0.0000**	**20.9731**

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	8.0000e-005	3.0900e-003	4.9000e-004	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	2.9000e-004	1.0000e-005	3.0000e-004	0.0000	0.6689	0.6689	5.0000e-005	0.0000	0.6702
Vendor	3.6000e-004	0.0125	2.6500e-003	3.0000e-005	7.7000e-004	3.0000e-005	7.9000e-004	2.2000e-004	2.0000e-005	2.5000e-004	0.0000	3.0651	3.0651	1.7000e-004	0.0000	3.0693
Worker	9.8000e-004	7.0000e-004	7.2900e-003	2.0000e-005	2.4200e-003	2.0000e-005	2.4400e-003	6.4000e-004	1.0000e-005	6.6000e-004	0.0000	2.0761	2.0761	5.0000e-005	0.0000	2.0774

Total	**1.4200e-003**	**0.0163**	**0.0104**	**6.0000e-005**	**4.3800e-003**	**6.0000e-005**	**4.4200e-003**	**1.1500e-003**	**4.0000e-005**	**1.2100e-003**	**0.0000**	**5.8101**	**5.8101**	**2.7000e-004**	**0.0000**	**5.8168**

3.7 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0225	0.1913	0.1986	3.5000e-004		9.1900e-003	9.1900e-003		8.6500e-003	8.6500e-003	0.0000	27.7569	27.7569	7.2800e-003	0.0000	27.9389
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0225**	**0.1913**	**0.1986**	**3.5000e-004**		**9.1900e-003**	**9.1900e-003**		**8.6500e-003**	**8.6500e-003**	**0.0000**	**27.7569**	**27.7569**	**7.2800e-003**	**0.0000**	**27.9389**

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	1.5000e-004	5.8500e-003	9.3000e-004	1.0000e-005	2.3000e-004	1.0000e-005	2.4000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	1.2650	1.2650	1.0000e-004	0.0000	1.2674
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	2.8700e-003	2.0500e-003	0.0215	7.0000e-005	7.1200e-003	5.0000e-005	7.1600e-003	1.8900e-003	4.0000e-005	1.9400e-003	0.0000	6.1063	6.1063	1.5000e-004	0.0000	6.1099
Total	**3.0200e-003**	**7.9000e-003**	**0.0224**	**8.0000e-005**	**7.3500e-003**	**6.0000e-005**	**7.4000e-003**	**1.9500e-003**	**5.0000e-005**	**2.0100e-003**	**0.0000**	**7.3712**	**7.3712**	**2.5000e-004**	**0.0000**	**7.3773**

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	3.3400e-003	0.1004	0.1730	3.5000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	27.7569	27.7569	7.2800e-003	0.0000	27.9388
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.3400e-003**	**0.1004**	**0.1730**	**3.5000e-004**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**27.7569**	**27.7569**	**7.2800e-003**	**0.0000**	**27.9388**

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	1.5000e-004	5.8500e-003	9.3000e-004	1.0000e-005	2.3000e-004	1.0000e-005	2.4000e-004	6.0000e-005	1.0000e-005	7.0000e-005	0.0000	1.2650	1.2650	1.0000e-004	0.0000	1.2674
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	2.8700e-003	2.0500e-003	0.0215	7.0000e-005	7.1200e-003	5.0000e-005	7.1600e-003	1.8900e-003	4.0000e-005	1.9400e-003	0.0000	6.1063	6.1063	1.5000e-004	0.0000	6.1099
Total	**3.0200e-003**	**7.9000e-003**	**0.0224**	**8.0000e-005**	**7.3500e-003**	**6.0000e-005**	**7.4000e-003**	**1.9500e-003**	**5.0000e-005**	**2.0100e-003**	**0.0000**	**7.3712**	**7.3712**	**2.5000e-004**	**0.0000**	**7.3773**

3.8 Architectural Coating - 2021

Unmitigated Construction On-Site

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

Archit. Coating	0.3333					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4700e-003	0.0198	0.0264	4.0000e-005		1.0300e-003	1.0300e-003		1.0200e-003	1.0200e-003	0.0000	3.6597	3.6597	5.3000e-004	0.0000	3.6730
Total	**0.3358**	**0.0198**	**0.0264**	**4.0000e-005**		**1.0300e-003**	**1.0300e-003**		**1.0200e-003**	**1.0200e-003**	**0.0000**	**3.6597**	**3.6597**	**5.3000e-004**	**0.0000**	**3.6730**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.6000e-004	1.6700e-003	1.0000e-005	5.5000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4749	0.4749	1.0000e-005	0.0000	0.4752
Total	**2.2000e-004**	**1.6000e-004**	**1.6700e-003**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4749**	**0.4749**	**1.0000e-005**	**0.0000**	**0.4752**

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	0.3333					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.5000e-004	0.0177	0.0279	4.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	3.6597	3.6597	5.3000e-004	0.0000	3.6730
Total	**0.3342**	**0.0177**	**0.0279**	**4.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**	**0.0000**	**3.6597**	**3.6597**	**5.3000e-004**	**0.0000**	**3.6730**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.6000e-004	1.6700e-003	1.0000e-005	5.5000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4749	0.4749	1.0000e-005	0.0000	0.4752
Total	**2.2000e-004**	**1.6000e-004**	**1.6700e-003**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4749**	**0.4749**	**1.0000e-005**	**0.0000**	**0.4752**

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	0.0952	0.6536	1.0810	4.2300e-003	0.3308	4.0200e-003	0.3348	0.0889	3.7700e-003	0.0927	0.0000	390.1187	390.1187	0.0161	0.0000	390.5221
Unmitigated	0.0952	0.6536	1.0810	4.2300e-003	0.3308	4.0200e-003	0.3348	0.0889	3.7700e-003	0.0927	0.0000	390.1187	390.1187	0.0161	0.0000	390.5221

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	431.59	157.34	46.13	884,459	884,459
Parking Lot	0.00	0.00	0.00		
Total	431.59	157.34	46.13	884,459	884,459

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
Industrial Park	9.50	7.30	7.30	59.00	28.00	13.00	79	19	2
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Industrial Park	0.560371	0.039285	0.190378	0.108244	0.016023	0.005202	0.023981	0.045200	0.002184	0.002561	0.005524	0.000326	0.000721
Parking Lot	0.560371	0.039285	0.190378	0.108244	0.016023	0.005202	0.023981	0.045200	0.002184	0.002561	0.005524	0.000326	0.000721

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	104.5739	104.5739	0.0105	2.1600e-003	105.4800
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	104.5739	104.5739	0.0105	2.1600e-003	105.4800
NaturalGas Mitigated	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	65.1819	65.1819	1.2500e-003	1.2000e-003	65.5692

NaturalGas Unmitigated	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	65.1819	65.1819	1.2500e-003	1.2000e-003	65.5692

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					
Industrial Park	1.22146e+006	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	65.1819	65.1819	1.2500e-003	1.2000e-003	65.5692
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**6.5900e-003**	**0.0599**	**0.0503**	**3.6000e-004**		**4.5500e-003**	**4.5500e-003**		**4.5500e-003**	**4.5500e-003**	**0.0000**	**65.1819**	**65.1819**	**1.2500e-003**	**1.2000e-003**	**65.5692**

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					
Industrial Park	1.22146e+006	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	65.1819	65.1819	1.2500e-003	1.2000e-003	65.5692
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**6.5900e-003**	**0.0599**	**0.0503**	**3.6000e-004**		**4.5500e-003**	**4.5500e-003**		**4.5500e-003**	**4.5500e-003**	**0.0000**	**65.1819**	**65.1819**	**1.2500e-003**	**1.2000e-003**	**65.5692**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	788611	103.7353	0.0104	2.1500e-003	104.6343
Parking Lot	6374.55	0.8385	8.0000e-005	2.0000e-005	0.8458
Total		**104.5739**	**0.0105**	**2.1700e-003**	**105.4800**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	788611	103.7353	0.0104	2.1500e-003	104.6343
Parking Lot	6374.55	0.8385	8.0000e-005	2.0000e-005	0.8458
Total		**104.5739**	**0.0105**	**2.1700e-003**	**105.4800**

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	0.2814	1.0000e-005	1.4400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Unmitigated	0.2814	1.0000e-005	1.4400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003

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	0.0333					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2480					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Total	**0.2814**	**1.0000e-005**	**1.4400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**2.7900e-003**	**2.7900e-003**	**1.0000e-005**	**0.0000**	**2.9700e-003**

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	0.0333					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2480					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Total	**0.2814**	**1.0000e-005**	**1.4400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**2.7900e-003**	**2.7900e-003**	**1.0000e-005**	**0.0000**	**2.9700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	15.0368	0.4772	0.0115	30.3813
Unmitigated	15.0368	0.4772	0.0115	30.3813

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	14.6127 / 0	15.0368	0.4772	0.0115	30.3813
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**15.0368**	**0.4772**	**0.0115**	**30.3813**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	14.6127 / 0	15.0368	0.4772	0.0115	30.3813
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**15.0368**	**0.4772**	**0.0115**	**30.3813**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	15.9064	0.9400	0.0000	39.4074
Unmitigated	15.9064	0.9400	0.0000	39.4074

8.2 Waste by Land Use

Unmitigated

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

Industrial Park	78.36	15.9064	0.9400	0.0000	39.4074
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**15.9064**	**0.9400**	**0.0000**	**39.4074**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	78.36	15.9064	0.9400	0.0000	39.4074
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**15.9064**	**0.9400**	**0.0000**	**39.4074**

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

Pape Machinery - Fremont

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Industrial Park	63.19	1000sqft	7.80	63,190.00	0
Parking Lot	93.00	Space	0.00	18,213.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2030
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 Rate for 2020

Land Use - From Data Request sheet

Construction Phase - Construction worksheet

Off-road Equipment - Add aerial lift

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Off-road Equipment - Construction worksheet

Trips and VMT - add 500 cement truck trips, 74 asphalt trip at vendor distance

Demolition - Construction worksheet

Grading - Construction worksheet

Energy Use -

Construction Off-road Equipment Mitigation - Tier 4 equipment and BMPs

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	PhaseEndDate	3/10/2020	3/11/2020
tblGrading	AcresOfGrading	0.00	10.00
tblLandUse	LandUseSquareFeet	37,200.00	18,213.00
tblLandUse	LotAcreage	1.45	7.80
tblLandUse	LotAcreage	0.84	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripLength	20.00	7.30
tblTripsAndVMT	HaulingTripLength	20.00	7.30
tblTripsAndVMT	HaulingTripNumber	0.00	500.00
tblTripsAndVMT	HaulingTripNumber	0.00	74.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2814	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Energy	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	169.7558	169.7558	0.0117	3.3600e-003	171.0493
Mobile	0.0602	0.4606	0.6768	3.5100e-003	0.3306	2.1900e-003	0.3327	0.0888	2.0400e-003	0.0908	0.0000	326.2218	326.2218	0.0116	0.0000	326.5109
Waste						0.0000	0.0000		0.0000	0.0000	15.9064	0.0000	15.9064	0.9400	0.0000	39.4074
Water						0.0000	0.0000		0.0000	0.0000	4.6359	10.4009	15.0368	0.4772	0.0115	30.3813
Total	**0.3483**	**0.5205**	**0.7285**	**3.8700e-003**	**0.3306**	**6.7500e-003**	**0.3373**	**0.0888**	**6.6000e-003**	**0.0954**	**20.5423**	**506.3812**	**526.9235**	**1.4405**	**0.0148**	**567.3517**

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	0.2814	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Energy	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	169.7558	169.7558	0.0117	3.3600e-003	171.0493
Mobile	0.0602	0.4606	0.6768	3.5100e-003	0.3306	2.1900e-003	0.3327	0.0888	2.0400e-003	0.0908	0.0000	326.2218	326.2218	0.0116	0.0000	326.5109
Waste						0.0000	0.0000		0.0000	0.0000	15.9064	0.0000	15.9064	0.9400	0.0000	39.4074
Water						0.0000	0.0000		0.0000	0.0000	4.6359	10.4009	15.0368	0.4772	0.0115	30.3813
Total	**0.3483**	**0.5205**	**0.7285**	**3.8700e-003**	**0.3306**	**6.7500e-003**	**0.3373**	**0.0888**	**6.6000e-003**	**0.0954**	**20.5423**	**506.3812**	**526.9235**	**1.4405**	**0.0148**	**567.3517**

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0602	0.4606	0.6768	3.5100e-003	0.3306	2.1900e-003	0.3327	0.0888	2.0400e-003	0.0908	0.0000	326.2218	326.2218	0.0116	0.0000	326.5109
Unmitigated	0.0602	0.4606	0.6768	3.5100e-003	0.3306	2.1900e-003	0.3327	0.0888	2.0400e-003	0.0908	0.0000	326.2218	326.2218	0.0116	0.0000	326.5109

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Industrial Park	431.59	157.34	46.13	884,459	884,459
Parking Lot	0.00	0.00	0.00		
Total	431.59	157.34	46.13	884,459	884,459

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
Industrial Park	9.50	7.30	7.30	59.00	28.00	13.00	79	19	2
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Industrial Park	0.566339	0.035990	0.189848	0.102849	0.012430	0.005068	0.026569	0.050520	0.002280	0.001770	0.005305	0.000389	0.000644
Parking Lot	0.566339	0.035990	0.189848	0.102849	0.012430	0.005068	0.026569	0.050520	0.002280	0.001770	0.005305	0.000389	0.000644

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	104.5739	104.5739	0.0105	2.1600e-003	105.4800
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	104.5739	104.5739	0.0105	2.1600e-003	105.4800
NaturalGas Mitigated	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	65.1819	65.1819	1.2500e-003	1.2000e-003	65.5692
NaturalGas Unmitigated	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	65.1819	65.1819	1.2500e-003	1.2000e-003	65.5692

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					
Industrial Park	1.22146e+006	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	65.1819	65.1819	1.2500e-003	1.2000e-003	65.5692
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**6.5900e-003**	**0.0599**	**0.0503**	**3.6000e-004**		**4.5500e-003**	**4.5500e-003**		**4.5500e-003**	**4.5500e-003**	**0.0000**	**65.1819**	**65.1819**	**1.2500e-003**	**1.2000e-003**	**65.5692**

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					
Industrial Park	1.22146e+006	6.5900e-003	0.0599	0.0503	3.6000e-004		4.5500e-003	4.5500e-003		4.5500e-003	4.5500e-003	0.0000	65.1819	65.1819	1.2500e-003	1.2000e-003	65.5692
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**6.5900e-003**	**0.0599**	**0.0503**	**3.6000e-004**		**4.5500e-003**	**4.5500e-003**		**4.5500e-003**	**4.5500e-003**	**0.0000**	**65.1819**	**65.1819**	**1.2500e-003**	**1.2000e-003**	**65.5692**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	788611	103.7353	0.0104	2.1500e-003	104.6343
Parking Lot	6374.55	0.8385	8.0000e-005	2.0000e-005	0.8458

Total		**104.5739**	**0.0105**	**2.1700e-003**	**105.4800**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Industrial Park	788611	103.7353	0.0104	2.1500e-003	104.6343
Parking Lot	6374.55	0.8385	8.0000e-005	2.0000e-005	0.8458
Total		**104.5739**	**0.0105**	**2.1700e-003**	**105.4800**

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	0.2814	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Unmitigated	0.2814	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003

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	0.0333					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2480					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Total	**0.2814**	**1.0000e-005**	**1.4300e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**2.7900e-003**	**2.7900e-003**	**1.0000e-005**	**0.0000**	**2.9700e-003**

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	0.0333					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consumer Products	0.2480					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.7900e-003	2.7900e-003	1.0000e-005	0.0000	2.9700e-003
Total	**0.2814**	**1.0000e-005**	**1.4300e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**2.7900e-003**	**2.7900e-003**	**1.0000e-005**	**0.0000**	**2.9700e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	15.0368	0.4772	0.0115	30.3813
Unmitigated	15.0368	0.4772	0.0115	30.3813

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	14.6127 / 0	15.0368	0.4772	0.0115	30.3813
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**15.0368**	**0.4772**	**0.0115**	**30.3813**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Industrial Park	14.6127 / 0	15.0368	0.4772	0.0115	30.3813
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**15.0368**	**0.4772**	**0.0115**	**30.3813**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	15.9064	0.9400	0.0000	39.4074
Unmitigated	15.9064	0.9400	0.0000	39.4074

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	78.36	15.9064	0.9400	0.0000	39.4074
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**15.9064**	**0.9400**	**0.0000**	**39.4074**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Industrial Park	78.36	15.9064	0.9400	0.0000	39.4074
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**15.9064**	**0.9400**	**0.0000**	**39.4074**

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

Pape Fremont Project

Health Risk Assessment Emissions (tons/year)

	Unmitigated		Mitigated	
Category	DPM	PM2.5	DPM	PM2.5
Construction 2020	0.162	0.096	0.0116	0.0500
Construction 2021	0.019	0.003	0.0016	0.0033
Equipment Operation	0.001	0.001	0.0006	0.0006
Truck Traffic	0.001	0.002	0.0005	0.0021

from CalEEMod				
Unmitigated			Mitigated	
DPM	PM2.5		DPM	PM2.5
0.1623	0.096		0.0116	0.05
0.019	0.0033		0.0016	0.0033

This tool provides a quick estimation of the fuel use and emissions for your equipment in a specific year. The results may slightly differ from those from the official inventory model.

Instructions:

Enter the horsepwer, model year, and other details about your equipment in the Input box.

Make sure to update the ***load factor*** for your equipment using the lookup table.

The ***Output*** box gives a quick estimation of the fuel use, NOx, PM, and THC emission for your equipment.

Input

	Input Engine Here
Horsepower (hp)	212.5
Model year	2010
Calendar year	2021
Activity (annual hours)	274
Accumulated hours on equipment (estimate using annual-hours*age if you only know the age of the equipment)	8800
Load factor (check the lookup table)	0.4

Intermediate steps

HPbin	300
NOx_EF0	2.67
NOx_DR	3.5E-05
NOx_FCF	0.950
PM_EF0	0.10
PM_DR	5.0E-06
PM_FCF	0.90
THC_EF0	0.10
THC_DR	2.5E-05
THC_FCF	0.90
NOx_EF (g/hp-hr)	2.83
PM_EF (g/hp-hr)	0.13
THC_EF (g/hp-hr)	0.29
CO2_EF (kg/gallon-diesel)*	10.21
BSFC (lb/hp-hr)	0.367
Unit conversion (lb/gallon)	7.109

*Reference: www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Results

Fuel Used (gallon)	1202
NOx Emissions (kg)	65.9
PM Emissions (kg)	3.0
THC Emissions (kg)	6.7
CO2 Emissions (kg)	12276.1
NOx Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	2.83
PM Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.13
THC Emission Factor (including deterioration and fuel correction factor): gram/ bhp-hr	0.29

Loac Factor Lookup Table

Equipment Category	Equipment Type	Details	Load Factor
Agriculture equipment	Agricultural tractors		0.48
	Combine harvesters		0.44
	Forage & silage harvesters		0.44
	Cotton pickers		0.44
	Nut harvester		0.44
	Other harvesters		0.44
	Balers (self propelled)		0.50
	Bale wagons (self propelled)		0.50
	Swathers/windrowers/hay conditioners		0.48
	Hay Squeeze/Stack retriever		0.42
	Sprayers/Spray rigs		0.42
	Construction equipment		0.40
	Other non-mobile		0.48
	Forklifts		0.40
	Atvs		0.40
	Others		0.40
Portable equipment	All portable equipment		0.31
Cargo Handling Equipment	Construction equipment		0.55
	Container handling equipment		0.59
	Forklift		0.30
	Other general industrial equipment		0.51
	Rtg crane		0.20
	Yard tractor		0.39
Transport Refrigeration Units (TRU)	TRU on trailers	25 HP and over, MY2012 and Older	0.46
	TRU on trailers	25 HP and over, MY2013 and Newer	0.38
	TRU on trailers	23 HP and Over, below 25 HP, All years	0.46
	TRU on trucks	Below 23 HP, All Model years	0.56
	TRU on railcars	25 HP and over, MY2012 and Older	0.33
	TRU on railcars	25 HP and over, MY2013 and Newer	0.27
	TRU on railcars	Below 25 HP, All Model years	0.33
	TRU with generators	25 HP and over, MY2012 and Older	0.46
	TRU with generators	25 HP and Over, MY2013 and Newer	0.38
	TRU with generators	23 HP and Over, below 25 HP, All Model Years	0.46
Ground Support Equipment	Passenger Stand		0.40
	A/C Tug Narrow Body		0.54
	A/C Tug Wide Body		0.54
	Baggage Tug		0.37
	Belt Loader		0.34
	Bobtail		0.37
	Cargo Loader		0.34
	Cargo Tractor		0.36
	Forklift (GSE)		0.20
	Lift (GSE)		0.34
	Other GSE		0.34
Construction and Industrial Equipment	Cranes		0.29
	Crawler Tractors		0.43
	Excavators		0.38
	Graders		0.41
	Off-Highway Tractors		0.44
	Off-Highway Trucks		0.38
	Other Construction Equipment		0.42
	Pavers		0.42
	Paving Equipment		0.36
	Rollers		0.38
	Rough Terrain Forklifts		0.40
	Rubber Tired Dozers		0.40
	Rubber Tired Loaders		0.36
	Scrapers		0.48
	Skid Steer Loaders		0.37
	Surfacing Equipment		0.30
	Tractors/Loaders/Backhoes		0.37
	Trenchers		0.50
	Aerial Lifts		0.31
	Forklifts		0.20
	Other General Industrial Equipment		0.34
	Other Material Handling Equipment		0.40
	Sweepers/Scrubbers		0.46

Pape Yard Equipment Emissions Calculations

HP Category	Average	Count	%	Hrs/year
<25	25	16	31%	1460
26-50	37.5	12	23%	1095
51-120	85	19	37%	1734
121-175	147.5	2	4%	183
176-250	212.5	3	6%	274
>250		0	0%	0
Total:		52	100%	
Avg. hours/day:		0.25		13
Total hours/year:		91.25		4745
Adjust 15 pieces *0.25hr/day				1369

	Tier 4 Annual Emissions (kg)				
	ROG	Nox	PM10	PM2.5	CO2
	1.8	38.6	0.7	0.7	8555
	2.1	43.5	0.8	0.8	9625
	4.1	117.2	7.5	7.5	43184
	0.6	9.9	0.1	0.1	5691
	1.3	2.7	0.2	0.2	12276
Sum:					
kg	9.9	211.9	9.3	9.3	79,331
tons	0.01	0.23	0.01	0.01023	
MetricTons					79

	Model Year 2010 Annual Emissions (kg)				
	ROG	Nox	PM10	PM2.5	CO2
	5.9	73.4	3.6	3.6	8555
	6.7	82.6	4	4	9625
	17	176	16	16	43184
	3.1	34.2	2.1	2.1	5691
	6.7	65.9	3	3	12276
	39.4	432.1	28.7	28.7	79,331
	0.04	0.48	0.03	0.03157	
					79

Load Factor	**0.4** avg
Cranes	0.2881
Crawler Tractors	0.4288
Excavators	0.3819
Graders	0.4087
Off-Highway Tractors	0.4355
Off-Highway Trucks	0.3819
Other Construction Equ	0.4154
Pavers	0.4154
Paving Equipment	0.3551
Rollers	0.3752
Rough Terrain Forklifts	0.402
Rubber Tired Dozers	0.3953
Rubber Tired Loaders	0.3618
Scrapers	0.4824
Skid Steer Loaders	0.3685
Surfacing Equipment	0.3015
Tractors/Loaders/Backh	0.3685
Trenchers	0.5025
Aerial Lifts	0.3082
Forklifts	0.201
Other General Industria	0.3417
Other Material Handlin	0.3953
Sweepers/Scrubbers	0.4556

	80% Tier 4 and 15% Model 2010				
	ROG	**NOx**	**PM10**	**PM2.5**	**CO2**
kg	15.80	255.94	13.18	13.18	79330.87
Adjust for annual time	4.56	73.83	3.80	3.80	22883.90
tons	0.01	0.08	0.00	0.00	25.17
MetricTons					23
	DPM/PM2.5 grams/day =			**1.39**	

Pape Yard Equipment Emissions Calculations

	ROG	NOx	PM10	PM2.5	CO2
18 Trucks/day (daily lbs/day)	0.1	3.9	0.8	0.2	1886
Annual (tons)	0.02	0.71	0.14	0.03	312

Onsite DPM = 1.3 grams/day

Onsite PM2.5 = 5.2 grams/day

Pollutant Name	(grams)	(grams)	(grams)	(grams)	(grams)	(grams	(US tons)		
PM2.5	17.4	-	4.4	23.1	40.5	85.4	< 0.001		
PM10	18.2	-	17.4	53.9	269.8	359.4	< 0.001		
NOx	1,767.20	-	-	-	-	1,767.20	0.002		
CO	235.6	-	-	-	-	235.6	< 0.001		
ROG	39.4	2.4	-	-	-	41.8	< 0.001		GHG in grams
Diesel PM	18.1	-	-	-	-	18.1	< 0.00	GWP	
CO2	804,705.20	-	-	-	-	########	0.887		804,705.20
N2O	124.4	-	-	-	-	124.4	< 0.00	296	36822.4
CH4	8.7	0.3	-	-	-	9.1	< 0.00	23	209.3
BC	2.7	-	-	-	-	2.7	< 0.001		
HFC	-	1.2	-	-	-	1.2	< 0.00	12000	14400
							CO2e =		856,136.90

MAKE/MODEL	TYPE	SERIAL NUMBER	Year	HP	EIN # / NOTES
JD/75G	EXCAVATOR	1FF075GXKJJ016560	2016	57	EIN# GE9N67
JD/85G	EXCAVATOR	1FF085GXCKJ020769		57	THIS MACHINE IS NO LONGER HERE. MOVED TO ANOTHER STORE
JD/85G	EXCAVATOR	1FF085GXEJJ020552		57	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/345GLC	EXCAVATOR	1FF345GXEKF020371		250	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/345GLC	EXCAVATOR	1FF345GXLKF020447		250	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/345GLC	EXCAVATOR	1FF345GXPKF020410		250	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
HI/ZX3456	EXCAVATOR	HCMDD560C00010103			NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/450KLT	CRAWLER DOZER	1T0450KXEHF316335	2017	80	EIN # FB5U67 THIS IS NO LONGER HERE. SOLD TO A CUSTOMER
JD/550KXL	CRAWLER DOZER	1T0550KKVJF336884	2018	89	EIN # MU3C84
JD/524L	WHEEL LOADER	1DW524LZKKF696173	2018	152	EIN # WC5C69
JD/644KHY	HYBRID LOADER	1DW644KAVKE697196			NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/210L	TRACTOR LOADER	1T8210LXHKF896304	2017	93	EIN # LG5A88
JD/210L	TRACTOR LOADER	1T8210LXPKF896311	2017	93	EIN # KK4L87
JD/210L	TRACTOR LOADER	1T8210LXTKF896470		93	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/310SL	BACKHOE LOADER	1T0310SLJJF338577	2018	54	EIN # TK6V84
JD/310SL	BACKHOE LOADER	1T0310SLTKF355134		54	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/410L	BACKHOE LOADER	1T0410LXCKF355484	2019	115	EIN # AM3P36
JD/17G	EXCAVATOR	1FF017GXCKK229058		15	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/17G	EXCAVATOR	1FF017GXCKK229061		15	NO LONGER HERE. SOLD TO A CUSTOMER. NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/17G	EXCAVATOR	1FF017GXEKK229057		15	NO LONGER HERE. SOLD TO A CUSTOMER. NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/17G	EXCAVATOR	1FF017GXKKK229162		15	NO LONGER HERE. SOLD TO A CUSTOMER. NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/17G	EXCAVATOR	1FF017GXPKK229161		15	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/17G	EXCAVATOR	1FF017GXTKK229059		15	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
HI/ZX26U5	EXCAVATOR	HCMACB60C00262672		20	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
HI/ZX26U5	EXCAVATOR	HCMACB60T00262066		20	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/30G	EXCAVATOR	1FF030GXCJK266241		23	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/30G	EXCAVATOR	1FF030GXEJK266223		23	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/30G	EXCAVATOR	1FF030GXVJK265860		23	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
HI/ZX30U5	EXCAVATOR	HCMADQ60K00265358			NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/35G	EXCAVATOR	1FF035GXEKK285806		23	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/35G	EXCAVATOR	1FF035GXTKK286473		23	NO LONGER HERE. SOLD TO A CUSTOMER. NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/35G	EXCAVATOR	1FF035GXVKK285055		23	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
JD/50G	EXCAVATOR	1FF050GXEKH289929	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXHKH289752	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXHKH289928	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXJKH289937	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXJKH290456	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXKKH290455	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXLKH290463	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXPJH288296	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXPJH288671	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXTKH289755	2018	36	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/50G	EXCAVATOR	1FF050GXVKH290458	2016	36	EIN # TP6R34 NO LONGER HERE. SOLD TO A CUSTOMER
JD/324L	WHEEL LOADER	1LU324LXAZB053633			NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/312GR	SKID STEER	1T0312GACKJ360364	2018	51	EIN # GY5E97 NO LONGER HERE. MOVED TO ANOTHER STORE
JD/318G	SKID STEER	1T0318GJCKJ357295		65	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/318G	SKID STEER	1T0318GKCGJ297292	2016	65	EIN # HK4D96
JD/318G	SKID STEER	1T0318GKKKJ357884		65	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/320E	SKID STEER	1T0320EKJHJ318367	2017	70	EIN # RU7W95
JD/320G	SKID STEER	1T0320GJKJJ337154		69	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
JD/320G	SKID STEER	1T0320GMTKJ360037		69	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
F4/MHL350	SCRAP HANDLER	350410-5553		50	NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
DY/CA1300	ROLLER	10000159KJA023051	2019	37	EIN # WG4H75
DY/CC900	ROLLER	10000301P0A011525	2013	25	EIN # NB4T99
DY/CC800	ROLLER	10000357JHA019670		20	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
DY/CC800	ROLLER	10000357PHA019598		20	NOT REGISTERED W/ CARB AS THIS MACHINE IS TOO SMALL. HORSEPOWER IS LESS THAN 25
S8/SW850N	ROLLER	4SW56-50265			NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
S8/SW354	ROLLER	4SW78-30155			NOT SOLD/RENTED OUT YET. BRAND NEW/NOT BEING USED YET
TK/TKT12U	TRAILER	1TKU02621JR036842			EIN NOT REQUIRED FOR TRAILERS
TK/TKT12U	TRAILER	1TKU02623JR036843			EIN NOT REQUIRED FOR TRAILERS
TK/TKT12U	TRAILER	1TKU02625KR061440			EIN NOT REQUIRED FOR TRAILERS
TK/TKT12U	TRAILER	1TKU02625KR061809			EIN NOT REQUIRED FOR TRAILERS
TK/TKT12U	TRAILER	1TKU02627KR061438			EIN NOT REQUIRED FOR TRAILERS
TK/TKT12U	TRAILER	1TKU02629KR061439			EIN NOT REQUIRED FOR TRAILERS
TS/T-14DT	TRAILER	4KNBT2725KL162802			EIN NOT REQUIRED FOR TRAILERS
TS/T-14DT	TRAILER	4KNBT2725LL160078			EIN NOT REQUIRED FOR TRAILERS
TS/T-30	TRAILER	4KNFT3028HL161251			EIN NOT REQUIRED FOR TRAILERS
TK/TKT50L	TRAILER	1TKC03536LR072217			EIN NOT REQUIRED FOR TRAILERS. THIS TRAILER IS NO LONGER HERE. MOVED TO ANOTHER STORE

Attachment 3: Construction and Operation Health Risk Calculations

Construction

Pape Machinery, Fremont, CA

DPM Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2020-2021	Construction	0.1813	CON_DPM	362.6	0.08279	1.04E-02	31912.71	3.27E-07

Construction Hours

hr/day = 12 (7am - 7pm)

days/yr = 365

hours/year = 4380

Pape Machinery, Fremont, CA

PM2.5 Fugitive Dust Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2020-2021	Construction	CON_FUG	0.0993	198.5	0.04532	5.71E-03	31913	1.79E-07

Construction Hours

hr/day = 12 (7am - 7pm)

days/yr = 365

hours/year = 4380

Pape Machinery, Fremont, CA

DPM Emissions and Modeling Emission Rates - With Tier 4 engines

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2020-2021	Construction	0.0132	CON_DPM	26.4	0.00602	7.58E-04	31912.71	2.38E-08

Construction Hours

hr/day = 12 (7am - 7pm)

days/yr = 365

hours/year = 4380

Pape Machinery, Fremont, CA

PM2.5 Fugitive Dust Emissions for Modeling - With Tier 4 engines

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	(lb/yr)	(lb/hr)	(g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2020-2021	Construction	CON_FUG	0.0529	105.7	0.02414	3.04E-03	31913	9.53E-08

Construction Hours

hr/day = 12 (7am - 7pm)

days/yr = 365

hours/year = 4380

Pape Machinery, Fremont, CA - Construction Health Impact Summary

Maximum Impacts at MEI Location - Unmitigated

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	Adult	(-)	($\mu g/m^3$)
2020-2021	0.0274	0.0155	**4.9**	**0.1**	**0.01**	**0.04**

Maximum Impacts at MEI Location - With Tier 4 Interim Engine Use

Emissions Year	Maximum Concentrations		Cancer Risk (per million)		Hazard Index	Maximum Annual PM2.5 Concentration
	Exhaust PM10/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)	Infant/Child	Adult	(-)	($\mu g/m^3$)
2020-2021	0.0020	0.0082	**0.4**	**0.01**	**0.0004**	**0.01**

Maximum Impacts at Averroes High School - Unmitigated

Construction Year	Unmitigated Emissions				
	Maximum Concentrations		Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)			
2020-2021	0.0214	0.0121	**1.0**	**0.004**	**0.03**

Maximum Impacts at Averroes High School - With Tier 4 Interim Engine Use

Construction Year	Unmitigated Emissions				
	Maximum Concentrations		Child Cancer Risk (per million)	Hazard Index (-)	Maximum Annual PM2.5 Concentration ($\mu g/m^3$)
	Exhaust PM2.5/DPM ($\mu g/m^3$)	Fugitive PM2.5 ($\mu g/m^3$)			
2020-2021	0.0016	0.0064	**0.1**	**0.0003**	**0.01**

Pape Machinery, Fremont, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum	
							Modeled					
Exposure Year	Exposure Duration (years)	Age	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2020-2021	0.0274	10	0.37	2020-2021	0.0274	-	-		
1	1	0 - 1	2020-2021	0.0274	10	4.51	2020-2021	0.0274	1	0.08	0.0155	0.0429
2	1	1 - 2	0	0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3	0	0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4	0	0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5	0	0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6	0	0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7	0	0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8	0	0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9	0	0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10	0	0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11	0	0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12	0	0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13	0	0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14	0	0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15	0	0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16	0	0.0000	3	0.00		0.0000	1	0.00		
17	1	16 - 17	0	0.0000	1	0.00		0.0000	1	0.00		
18	1	17 - 18	0	0.0000	1	0.00		0.0000	1	0.00		
19	1	18 - 19	0	0.0000	1	0.00		0.0000	1	0.00		
20	1	19 - 20	0	0.0000	1	0.00		0.0000	1	0.00		
21	1	20 - 21	0	0.0000	1	0.00		0.0000	1	0.00		
22	1	21 - 22	0	0.0000	1	0.00		0.0000	1	0.00		
23	1	22 - 23	0	0.0000	1	0.00		0.0000	1	0.00		
24	1	23 - 24	0	0.0000	1	0.00		0.0000	1	0.00		
25	1	24 - 25	0	0.0000	1	0.00		0.0000	1	0.00		
26	1	25 - 26	0	0.0000	1	0.00		0.0000	1	0.00		
27	1	26 -27	0	0.0000	1	0.00		0.0000	1	0.00		
28	1	27 - 28	0	0.0000	1	0.00		0.0000	1	0.00		
29	1	28 - 29	0	0.0000	1	0.00		0.0000	1	0.00		
30	1	29 - 30	0	0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**4.9**				**0.08**		

* Third trimester of pregnancy

Pape Machinery, Fremont, CA - Construction Impacts - With Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum	
							Modeled					
Exposure Year	Exposure Duration (years)	Age	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2020-2021	0.0020	10	0.03	2020-2021	0.0020	-	-		
1	1	0 - 1	2020-2021	0.0020	10	0.33	2020-2021	0.0020	1	0.01	0.0082	0.0102
2	1	1 - 2	0	0.0000	10	0.00		0.0000	1	0.00		
3	1	2 - 3	0	0.0000	3	0.00		0.0000	1	0.00		
4	1	3 - 4	0	0.0000	3	0.00		0.0000	1	0.00		
5	1	4 - 5	0	0.0000	3	0.00		0.0000	1	0.00		
6	1	5 - 6	0	0.0000	3	0.00		0.0000	1	0.00		
7	1	6 - 7	0	0.0000	3	0.00		0.0000	1	0.00		
8	1	7 - 8	0	0.0000	3	0.00		0.0000	1	0.00		
9	1	8 - 9	0	0.0000	3	0.00		0.0000	1	0.00		
10	1	9 - 10	0	0.0000	3	0.00		0.0000	1	0.00		
11	1	10 - 11	0	0.0000	3	0.00		0.0000	1	0.00		
12	1	11 - 12	0	0.0000	3	0.00		0.0000	1	0.00		
13	1	12 - 13	0	0.0000	3	0.00		0.0000	1	0.00		
14	1	13 - 14	0	0.0000	3	0.00		0.0000	1	0.00		
15	1	14 - 15	0	0.0000	3	0.00		0.0000	1	0.00		
16	1	15 - 16	0	0.0000	3	0.00		0.0000	1	0.00		
17	1	16 - 17	0	0.0000	1	0.00		0.0000	1	0.00		
18	1	17 - 18	0	0.0000	1	0.00		0.0000	1	0.00		
19	1	18 - 19	0	0.0000	1	0.00		0.0000	1	0.00		
20	1	19 - 20	0	0.0000	1	0.00		0.0000	1	0.00		
21	1	20 - 21	0	0.0000	1	0.00		0.0000	1	0.00		
22	1	21 - 22	0	0.0000	1	0.00		0.0000	1	0.00		
23	1	22 - 23	0	0.0000	1	0.00		0.0000	1	0.00		
24	1	23 - 24	0	0.0000	1	0.00		0.0000	1	0.00		
25	1	24 - 25	0	0.0000	1	0.00		0.0000	1	0.00		
26	1	25 - 26	0	0.0000	1	0.00		0.0000	1	0.00		
27	1	26 -27	0	0.0000	1	0.00		0.0000	1	0.00		
28	1	27 - 28	0	0.0000	1	0.00		0.0000	1	0.00		
29	1	28 - 29	0	0.0000	1	0.00		0.0000	1	0.00		
30	1	29 - 30	0	0.0000	1	0.00		0.0000	1	0.00		
Total Increased Cancer Risk						**0.4**				**0.01**		

* Third trimester of pregnancy

Averroes Junior High School, Fremont, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk Calculations From Construction
Highschool - 1.5 meters - Child Exposure

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

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

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

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

Values

	Infant	School Child	Adult
Age -->	**0 - <2**	**2 - <16**	**16 - 30**
Parameter			
ASF =	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00
8-Hr BR* =	1200	520	240
A =	1	1	1
EF =	350	180	250
AT =	70	70	70
SAF =	1.00	3.73	1.00

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)	Maximum Hazard Index	Maximum Fugitive PM2.5	Maximum Total PM2.5
1	1	2020-2021	0.02144	3	**1.0**	0.0043	0.0121	0.0335

Averroes Junior High School, Fremont, CA - Construction Impacts - With Mitigation
Maximum DPM Cancer Risk Calculations From Construction
Highschool - 1.5 meters - Child Exposure

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

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

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

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

Values

	Infant	School Child	Adult
Age -->	**0 - <2**	**2 - <16**	**16 - 30**
Parameter			
ASF =	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00
8-Hr BR* =	1200	520	240
A =	1	1	1
EF =	350	180	250
AT =	70	70	70
SAF =	1.00	3.73	1.00

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)	Maximum Hazard Index	Maximum Fugitive PM2.5	Maximum Total PM2.5
1	1	2020-2021	0.00156	3	**0.1**	0.0003	0.0064	0.0080

Operation

Pape Machinery, Fremont, CA - Equipment & Traffic Operation

DPM Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2020-2021	Construction	0.0011	CON_DPM	2.2	0.00049	6.22E-05	31912.71	1.95E-09

Construction Hours

hr/day =	12	(7am - 7pm)
days/yr =	365	
hours/year =	4380	

Pape Machinery, Fremont, CA - Equipment & Traffic Operation

PM2.5 Fugitive Dust Emissions for Modeling - Unmitigated

Construction Year	Activity	Area Source	PM2.5 Emissions (ton/year)	PM2.5 Emissions (lb/yr)	PM2.5 Emissions (lb/hr)	PM2.5 Emissions (g/s)	Modeled Area (m^2)	PM2.5 Emission Rate $g/s/m^2$
2020-2021	Construction	CON_FUG	0.0026	5.3	0.00121	1.52E-04	31913	4.77E-09

Construction Hours

hr/day =	12	(7am - 7pm)
days/yr =	365	
hours/year =	4380	

Pape Machinery, Fremont, CA - Construction Impacts - Without Mitigation
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction
Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

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

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

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum	
							Modeled					
Exposure Year	Exposure Duration (years)	Age	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2020-2021	0.0274	10	0.37	2020-2021	0.0274	-	-		
1	1	0 - 1	2020-2021	0.0274	10	4.51	2020-2021	0.0274	1	0.08	0.0155	0.0429
2	1	1 - 2	2021	0.0002	10	0.03	2021	0.0002	1	0.00	0.0004	0.0006
3	1	2 - 3	2022	0.0002	3	0.00	2022	0.0002	1	0.00		
4	1	3 - 4	2023	0.0002	3	0.00	2023	0.0002	1	0.00		
5	1	4 - 5	2024	0.0002	3	0.00	2024	0.0002	1	0.00		
6	1	5 - 6	2025	0.0002	3	0.00	2025	0.0002	1	0.00		
7	1	6 - 7	2026	0.0002	3	0.00	2026	0.0002	1	0.00		
8	1	7 - 8	2027	0.0002	3	0.00	2027	0.0002	1	0.00		
9	1	8 - 9	2028	0.0002	3	0.00	2028	0.0002	1	0.00		
10	1	9 - 10	2029	0.0002	3	0.00	2029	0.0002	1	0.00		
11	1	10 - 11	2030	0.0002	3	0.00	2030	0.0002	1	0.00		
12	1	11 - 12	2031	0.0002	3	0.00	2031	0.0002	1	0.00		
13	1	12 - 13	2032	0.0002	3	0.00	2032	0.0002	1	0.00		
14	1	13 - 14	2033	0.0002	3	0.00	2033	0.0002	1	0.00		
15	1	14 - 15	2034	0.0002	3	0.00	2034	0.0002	1	0.00		
16	1	15 - 16	2035	0.0002	3	0.00	2035	0.0002	1	0.00		
17	1	16 - 17	2036	0.0002	1	0.00	2036	0.0002	1	0.00		
18	1	17 - 18	2037	0.0002	1	0.00	2037	0.0002	1	0.00		
19	1	18 - 19	2038	0.0002	1	0.00	2038	0.0002	1	0.00		
20	1	19 - 20	2039	0.0002	1	0.00	2039	0.0002	1	0.00		
21	1	20 - 21	2040	0.0002	1	0.00	2040	0.0002	1	0.00		
22	1	21 - 22	2041	0.0002	1	0.00	2041	0.0002	1	0.00		
23	1	22 - 23	2042	0.0002	1	0.00	2042	0.0002	1	0.00		
24	1	23 - 24	2043	0.0002	1	0.00	2043	0.0002	1	0.00		
25	1	24 - 25	2044	0.0002	1	0.00	2044	0.0002	1	0.00		
26	1	25 - 26	2045	0.0002	1	0.00	2045	0.0002	1	0.00		
27	1	26 -27	2046	0.0002	1	0.00	2046	0.0002	1	0.00		
28	1	27 - 28	2047	0.0002	1	0.00	2047	0.0002	1	0.00		
29	1	28 - 29	2048	0.0002	1	0.00	2048	0.0002	1	0.00		
30	1	29 - 30	2049	0.0002	1	0.00	2049	0.0002	1	0.00		
Total Increased Cancer Risk						**5.0**				**0.09**		

* Third trimester of pregnancy

Pape Machinery, Fremont, CA - Construction and Operationa Impacts - With Tier 4 engines
Maximum DPM Cancer Risk and PM2.5 Calculations From Construction and Operation
Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

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

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

Construction and Opearation Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information				Adult - Exposure Information				Maximum	
							Modeled					
Exposure Year	Exposure Duration (years)	Age	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)	Fugitive PM2.5	Total PM2.5
0	0.25	-0.25 - 0*	2020-2021	0.0020	10	0.03	2020-2021	0.0020	-	-		
1	1	0 - 1	2020-2021	0.0020	10	0.33	2020-2021	0.0020	1	0.01	0.0082	0.0102
2	1	1 - 2	2021	0.0002	10	0.03	2021	0.0002	1	0.00	0.0004	0.0006
3	1	2 - 3	2022	0.0002	3	0.00	2022	0.0002	1	0.00		
4	1	3 - 4	2023	0.0002	3	0.00	2023	0.0002	1	0.00		
5	1	4 - 5	2024	0.0002	3	0.00	2024	0.0002	1	0.00		
6	1	5 - 6	2025	0.0002	3	0.00	2025	0.0002	1	0.00		
7	1	6 - 7	2026	0.0002	3	0.00	2026	0.0002	1	0.00		
8	1	7 - 8	2027	0.0002	3	0.00	2027	0.0002	1	0.00		
9	1	8 - 9	2028	0.0002	3	0.00	2028	0.0002	1	0.00		
10	1	9 - 10	2029	0.0002	3	0.00	2029	0.0002	1	0.00		
11	1	10 - 11	2030	0.0002	3	0.00	2030	0.0002	1	0.00		
12	1	11 - 12	2031	0.0002	3	0.00	2031	0.0002	1	0.00		
13	1	12 - 13	2032	0.0002	3	0.00	2032	0.0002	1	0.00		
14	1	13 - 14	2033	0.0002	3	0.00	2033	0.0002	1	0.00		
15	1	14 - 15	2034	0.0002	3	0.00	2034	0.0002	1	0.00		
16	1	15 - 16	2035	0.0002	3	0.00	2035	0.0002	1	0.00		
17	1	16 - 17	2036	0.0002	1	0.00	2036	0.0002	1	0.00		
18	1	17 - 18	2037	0.0002	1	0.00	2037	0.0002	1	0.00		
19	1	18 - 19	2038	0.0002	1	0.00	2038	0.0002	1	0.00		
20	1	19 - 20	2039	0.0002	1	0.00	2039	0.0002	1	0.00		
21	1	20 - 21	2040	0.0002	1	0.00	2040	0.0002	1	0.00		
22	1	21 - 22	2041	0.0002	1	0.00	2041	0.0002	1	0.00		
23	1	22 - 23	2042	0.0002	1	0.00	2042	0.0002	1	0.00		
24	1	23 - 24	2043	0.0002	1	0.00	2043	0.0002	1	0.00		
25	1	24 - 25	2044	0.0002	1	0.00	2044	0.0002	1	0.00		
26	1	25 - 26	2045	0.0002	1	0.00	2045	0.0002	1	0.00		
27	1	26 -27	2046	0.0002	1	0.00	2046	0.0002	1	0.00		
28	1	27 - 28	2047	0.0002	1	0.00	2047	0.0002	1	0.00		
29	1	28 - 29	2048	0.0002	1	0.00	2048	0.0002	1	0.00		
30	1	29 - 30	2049	0.0002	1	0.00	2049	0.0002	1	0.00		
Total Increased Cancer Risk						**0.4**				**0.02**		

* Third trimester of pregnancy

Pape Machinery, Fremont, CA - Lifetime Operation Impacts
Maximum DPM Cancer Risk and PM2.5 Calculations From Operation
Impacts at Off-Site MEI Location - 1.5 meter receptor height

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

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

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

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

Values

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

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

Construction and Operation Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult	Maximum	
							Modeled					
Exposure	Exposure Duration		DPM Conc (ug/m3)		Age Sensitivity	Cancer Risk	DPM Conc (ug/m3)		Age Sensitivity	Cancer Risk	Fugitive	Total
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	PM2.5	PM2.5
0	0.25	-0.25 - 0*	2020	0.0002	10	0.002	2020	0.0002	-	-		
1	1	0 - 1	2020	0.0002	10	0.03	2020	0.0002	1	0.00	0.0004	0.0006
2	1	1 - 2	2021	0.0002	10	0.03	2021	0.0002	1	0.00		
3	1	2 - 3	2022	0.0002	3	0.00	2022	0.0002	1	0.00		
4	1	3 - 4	2023	0.0002	3	0.00	2023	0.0002	1	0.00		
5	1	4 - 5	2024	0.0002	3	0.00	2024	0.0002	1	0.00		
6	1	5 - 6	2025	0.0002	3	0.00	2025	0.0002	1	0.00		
7	1	6 - 7	2026	0.0002	3	0.00	2026	0.0002	1	0.00		
8	1	7 - 8	2027	0.0002	3	0.00	2027	0.0002	1	0.00		
9	1	8 - 9	2028	0.0002	3	0.00	2028	0.0002	1	0.00		
10	1	9 - 10	2029	0.0002	3	0.00	2029	0.0002	1	0.00		
11	1	10 - 11	2030	0.0002	3	0.00	2030	0.0002	1	0.00		
12	1	11 - 12	2031	0.0002	3	0.00	2031	0.0002	1	0.00		
13	1	12 - 13	2032	0.0002	3	0.00	2032	0.0002	1	0.00		
14	1	13 - 14	2033	0.0002	3	0.00	2033	0.0002	1	0.00		
15	1	14 - 15	2034	0.0002	3	0.00	2034	0.0002	1	0.00		
16	1	15 - 16	2035	0.0002	3	0.00	2035	0.0002	1	0.00		
17	1	16 - 17	2036	0.0002	1	0.00	2036	0.0002	1	0.00		
18	1	17 - 18	2037	0.0002	1	0.00	2037	0.0002	1	0.00		
19	1	18 - 19	2038	0.0002	1	0.00	2038	0.0002	1	0.00		
20	1	19 - 20	2039	0.0002	1	0.00	2039	0.0002	1	0.00		
21	1	20 - 21	2040	0.0002	1	0.00	2040	0.0002	1	0.00		
22	1	21 - 22	2041	0.0002	1	0.00	2041	0.0002	1	0.00		
23	1	22 - 23	2042	0.0002	1	0.00	2042	0.0002	1	0.00		
24	1	23 - 24	2043	0.0002	1	0.00	2043	0.0002	1	0.00		
25	1	24 - 25	2044	0.0002	1	0.00	2044	0.0002	1	0.00		
26	1	25 - 26	2045	0.0002	1	0.00	2045	0.0002	1	0.00		
27	1	26 -27	2046	0.0002	1	0.00	2046	0.0002	1	0.00		
28	1	27 - 28	2047	0.0002	1	0.00	2047	0.0002	1	0.00		
29	1	28 - 29	2048	0.0002	1	0.00	2048	0.0002	1	0.00		
30	1	29 - 30	2049	0.0002	1	0.00	2049	0.0002	1	0.00		
Total Increased Cancer Risk						**0.1**				**0.01**		

* Third trimester of pregnancy

Averroes High School, Fremont, CA -Construction & Operational Impacts-Without Mitigation
Maximum DPM Cancer Risk Calculations From Construction and Operation
Highschool - 1.5 meters - Child Exposure

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

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

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

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

Values

	Infant	School Child	Adult
Age -->	**0 - <2**	**2 - <16**	**16 - 30**
Parameter			
ASF =	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00
8-Hr BR* =	1200	520	240
A =	1	1	1
EF =	350	180	250
AT =	70	70	70
SAF =	1.00	3.73	1.00

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

Construction and Operation Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)		Hazard Index	Fugitive PM2.5	Total PM2.5
1	1	2020-2021	0.02144	3	1.0		0.0043	0.0121	0.0335
2	1	2021	0.0001	3	0.0		0.0000	0.0003	0.0005
3	1	2022	0.0001	3	0.0		0.0000	0.0003	0.0005
4	1	2023	0.0001	3	0.0		0.0000	0.0003	0.0005
5	1	2024	0.0001	3	0.0		0.0000	0.0003	0.0005
6	1	2025	0.0001	3	0.0		0.0000	0.0003	0.0005
7	1	2026	0.0001	3	0.0		0.0000	0.0003	0.0005
8	1	2027	0.0001	3	0.0		0.0000	0.0003	0.0005
9	1	2028	0.0001	3	0.0		0.0000	0.0003	0.0005
Total Increased Cancer Risk					**1.0**	**Max**	**0.004**	**0.012**	**0.033**

Averroes High School, Fremont, CA -Construction & Operational Impacts-With Mitigation
Maximum DPM Cancer Risk Calculations From Construction and Operation
Highschool - 1.5 meters - Child Exposure

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

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

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

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

Values

	Infant	School Child	Adult
Age -->	**0 - <2**	**2 - <16**	**16 - 30**
Parameter			
ASF =	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00
8-Hr BR* =	1200	520	240
A =	1	1	1
EF =	350	180	250
AT =	70	70	70
SAF =	1.00	3.73	1.00

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

Construction and Operation Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Child - Exposure Information: DPM Conc (ug/m3) Year	DPM Conc (ug/m3) Annual	Age* Sensitivity Factor	Child Cancer Risk (per million)		Hazard Index	Fugitive PM2.5	Total PM2.5
1	1	2020-2021	0.00156	3	0.1		0.0003	0.0064	0.0080
2	1	2021	0.0001	3	0.0		0.0000	0.0003	0.0005
3	1	2022	0.0001	3	0.0		0.0000	0.0003	0.0005
4	1	2023	0.0001	3	0.0		0.0000	0.0003	0.0005
5	1	2024	0.0001	3	0.0		0.0000	0.0003	0.0005
6	1	2025	0.0001	3	0.0		0.0000	0.0003	0.0005
7	1	2026	0.0001	3	0.0		0.0000	0.0003	0.0005
8	1	2027	0.0001	3	0.0		0.0000	0.0003	0.0005
9	1	2028	0.0001	3	0.0		0.0000	0.0003	0.0005
Total Increased Cancer Risk					**0.1**	**Max**	**0.0003**	**0.006**	**0.008**