APPENDIX G

CalEEMod Results and Health Risk Assessment

CUSD Stadium Improvement Project - Monterey County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

CUSD Stadium Improvement Project

Monterey County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Arena	1.00	Acre	1.00	43,560.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.6	**Precipitation Freq (Days)**	55
Climate Zone	5			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Table Name	Column Name	Default Value	New Value
tblVehicleTrips	WD_TR	33.33	36.82

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	lb/day										lb/day					
Mobile	0.0949	0.0951	0.7093	1.4500e-003	0.1364	1.2500e-003	0.1377	0.0364	1.1600e-003	0.0376		147.0918	147.0918	0.0103	7.2100e-003	149.4988

4.0 Operational Detail - Mobile

CUSD Stadium Improvement Project - Monterey County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Unmitigated	0.0949	0.0951	0.7093	1.4500e-003	0.1364	1.2500e-003	0.1377	0.0364	1.1600e-003	0.0376		147.0918	147.0918	0.0103	7.2100e-003	149.4988

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Arena	36.82	0.00	0.00	46,181	46,181
Total	36.82	0.00	0.00	46,181	46,181

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Arena	14.70	6.60	6.60	0.00	81.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Arena	0.515782	0.051067	0.193162	0.157474	0.028348	0.007041	0.010478	0.006757	0.001564	0.000504	0.023236	0.001469	0.003117

Date: 7/28/2022 3:34 PM

CUSD Stadium Improvement Project - Monterey County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

CUSD Stadium Improvement Project

Monterey County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Arena	1.00	Acre	1.00	43,560.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.6	**Precipitation Freq (Days)**	55
Climate Zone	5			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

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Unmitigated Operational

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Category	lb/day										lb/day					
Mobile	0.0883	0.1099	0.7845	1.3800e-003	0.1364	1.2500e-003	0.1377	0.0364	1.1600e-003	0.0376		140.7394	140.7394	0.0119	7.9900e-003	143.4190

4.0 Operational Detail - Mobile

CUSD Stadium Improvement Project - Monterey County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Unmitigated	0.0883	0.1099	0.7845	1.3800e-003	0.1364	1.2500e-003	0.1377	0.0364	1.1600e-003	0.0376		140.7394	140.7394	0.0119	7.9900e-003	143.4190

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Arena	14.70	6.60	6.60	0.00	81.00	19.00	66	28	6

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Arena	0.515782	0.051067	0.193162	0.157474	0.028348	0.007041	0.010478	0.006757	0.001564	0.000504	0.023236	0.001469	0.003117

CUSD Stadium Improvement Project - Monterey County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

CUSD Stadium Improvement Project

Monterey County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
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2.2 Overall Operational

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Category	tons/yr										MT/yr					
Mobile	0.0115	0.0135	0.0946	1.8000e-004	0.0172	1.6000e-004	0.0173	4.5900e-003	1.5000e-004	4.7400e-003	0.0000	16.6306	16.6306	1.3100e-003	9.0000e-004	16.9322

CUSD Stadium Improvement Project - Monterey County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

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

Date: July 28, 2022

To: **Teri Wissler Adam**
EMC Planning Group
601 Abrego Street
Monterey, CA 93940

From: James A. Reyff
Illingworth & Rodkin, Inc.
429 E. Cotati Ave
Cotati, CA 94931

RE: Carmel High School Stadium Improvements Project – Carmel-by-the-Sea, CA

SUBJECT: Localized Air Quality Impacts Job#22-040

This memo addresses local air quality concerns regarding a project that proposes installation of stadium lights at the Carmel High School field. Carmel High School (CHS) is located at 3600 Ocean Avenue in unincorporated Monterey County. There are nearby residences and the school itself that include sensitive receptors. The Project proposes to add lights to the existing football stadium on campus. To accommodate evening traffic, additional parking on site would be provided. This includes parking facilities where existing tennis courts are located and a new back parking lot area behind the pool. The school district will be removing some portable storage buildings and striping an existing paved area as a new storage structure that will be placed immediately next to the existing home bleachers. This assessment conservatively assumed these facilities would require new construction. The Project would attract new traffic on evenings when football games and other events occur.

Health Risk Impacts

Health risk impacts were addressed by predicting increased cancer risk from construction activity that involves use of diesel equipment and computing the Hazard Index (HI) for non-cancer health risks. The overall risk impacts from the project are the combination of risks from construction and operation sources. These sources include on-site construction activity, construction truck trips, and increased traffic from the project. To evaluate the increased cancer risks from the project, a 30-

year exposure period was used, per Monterey Bay Air Resources District (MBARD) guidance.[1]

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

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

Modeled Sensitive Receptors

Receptors for this assessment included locations where sensitive populations closest to the project would be present for extended periods of time (i.e., chronic exposures). This includes the existing residences surrounding the project site, as shown in Figure 1. Residential receptors are assumed to include all receptor groups (i.e., third trimester, infants, children, and adults) with almost continuous exposure to project emissions. While there are additional sensitive receptors within 1,000 feet of the project site, the receptors chosen are adequate to identify maximum impacts from the project.

Community Health Risk from Project Construction

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known TAC. These exhaust air pollutant emissions would not be considered to contribute substantially to existing or projected air quality violations. Construction exhaust emissions may still pose health risks for sensitive receptors such as surrounding residents. The primary community risk impacts associated with construction emissions are cancer risk. Diesel exhaust (i.e., DPM) 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.[2] This assessment included dispersion modeling to predict the off-site and on-site concentrations resulting from project construction, so that increased cancer risks and non-cancer health effects could be evaluated.

Construction Emissions

The CalEEMod model provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment and for exhaust emissions from on-road vehicles, with total DPM emissions from all construction stages estimated to be 0.02 tons (43 pounds). The on-road emissions are a result of haul truck travel during demolition and grading activities, worker travel, and vendor deliveries during construction. A trip length of half a mile was used to represent vehicle

[1] Monterey Bay Air Resources District (MBARD). 2016. Air District Guidelines for Implementing CEQA.
[2] DPM is identified by California as a toxic air contaminant due to the potential to cause cancer.

travel while at or near the construction site. It was assumed that these emissions from on-road vehicles traveling at or near the site would occur at the construction site. Fugitive $PM_{2.5}$ dust emissions were calculated by CalEEMod to be 0.02 tons (38 pounds) for the overall construction period.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (i.e., residences, school) in the vicinity of the project construction area. Emission sources for the construction site were grouped into two categories: exhaust emissions of DPM and fugitive $PM_{2.5}$ dust emissions.

To represent the construction equipment exhaust emissions, an area source emission release height of 20 feet (6 meters) was used for the area sources.[3] The release height incorporates both the physical release height from the construction equipment (i.e., the height of the exhaust pipe) and plume rise after it leaves the exhaust pipe. Plume rise is due to both the high temperature of the exhaust and the high velocity of the exhaust gas. It should be noted that when modeling an area source, plume rise is not calculated by the AERMOD dispersion model as it would do for a point source (exhaust stack). Therefore, the release height from an area source used to represent emissions from sources with plume rise, such as construction equipment, should be based on the height the exhaust plume is expected to achieve, not just the height of the top of the exhaust pipe.

For modeling fugitive $PM_{2.5}$ emissions, an area source was used with a near-ground level release height of 7 feet (2 meters). Fugitive dust emissions at construction sites come from a variety of sources, including truck and equipment travel, grading activities, truck loading (with loaders) and unloading (rear or bottom dumping), loaders and excavators moving and transferring soil and other materials, etc. All of these activities result in fugitive dust emissions at various heights at the point(s) of generation. Once generated, the dust plume will tend to rise as it moves downwind across the site and exit the site at a higher elevation than when it was generated. For all these reasons, a 7-foot release height was used as the average release height across the construction site. Emissions from the construction equipment and on-road vehicle travel were distributed throughout the modeled area sources.

The modeling used a five-year data set (2015, 2016, 2018, 2019, 2021) of hourly meteorological data from the Monterey Peninsula Airport that was prepared for use with the AERMOD model by the California Air Resources Board (CARB). Construction emissions were modeled as occurring daily between 8:00 a.m. to 5:00 p.m., when the majority of construction activity would occur. Annual DPM and $PM_{2.5}$ concentrations from construction activities during the 2023 period were calculated using the model. DPM and concentrations were calculated at nearby sensitive receptors. Receptor heights of 5 feet (1.5 meters) were used to represent the breathing height of nearby residences.[4]

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

[4] Bay Area Air Quality Management District, 2012, Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0. May. Web: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/risk-modeling-approach-may-2012.pdf?la=en

Operational Risks

The only source of air pollutants associated with operation of the project would be the new traffic generated by the project. Football games would attract 345 new vehicles per event. These are all new because games currently occur off site. Between field hockey, football, soccer, la crosse, and track, there are 32 to 39 events per year. Most of these events would generate less traffic. Assuming there are 39 evening events with 345 vehicles each, which would be a very conservative assumption, the Project would attract less than 13,455 trips per year. This small amount of vehicle activity would have a negligible project health risk impacts. The traffic would be comprised of mostly non-diesel light-duty vehicles that have low TAC emissions rates. Large diesel trucks are a source of DPM, the most toxic TAC from traffic, and this project does not generate truck traffic. Hence, health risk impacts from project traffic are negligible.

Health Risk Methodology

Monterey Bay Air Resources District (MBARD) applies current rules and regulations for evaluating impacts from TACs. Thresholds used to evaluate human health impacts in accordance with Air District Rules 1000 and 1003 are applied by the District in making significance determinations under CEQA.[5] A project would have a significant impact if:

- The hazard index is greater than 1 for acute or chronic impacts.
- The cancer risk is greater than 10 in one million.

A health risk assessment for exposure to 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 CARB develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[6] These guidelines incorporate methods designed to provide for enhanced protection of children, as required by State law. CARB has provided additional guidance on implementing OEHHA's recommended methods.[7] This health risk assessment used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. Current MBARD regulations/guidelines (Rule 1000 – Permit Guidelines and Requirements for Sources Emitting Toxic Air Contaminants) specify use of the most recent OEHHA guidelines when conducting health risk assessments. The new OEHHA guidelines and CARB recommended exposure parameters were used in this evaluation. Details of the methodology for computing cancer risk and non-cancer hazards are contained in *Attachment 1*.

Summary of Health Risk Impacts

The maximum increased cancer risks and non-cancer health hazards were calculated using the

[5] Monterey Bay Air Resources District (MBARD). 2016. *Air District Guidelines for Implementing CEQA. February 8. See https://www.mbard.org/files/b4d8179d3/CEQA+Implementation.pdf* Accessed July 20, 2022.
[6] 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.
[7] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

modeled TAC concentrations combined with the OEHHA guidance for age sensitivity factors and exposure parameters as recommended by MBARD, as described in *Attachment 1*. Age-sensitivity factors for infants were applied, which reflect their greater sensitivity to cancer causing TACs. The maximum computed HI values was based on the ratio of the maximum DPM concentration modeled and the chronic inhalation reference exposure level of 5 $\mu g/m^3$.

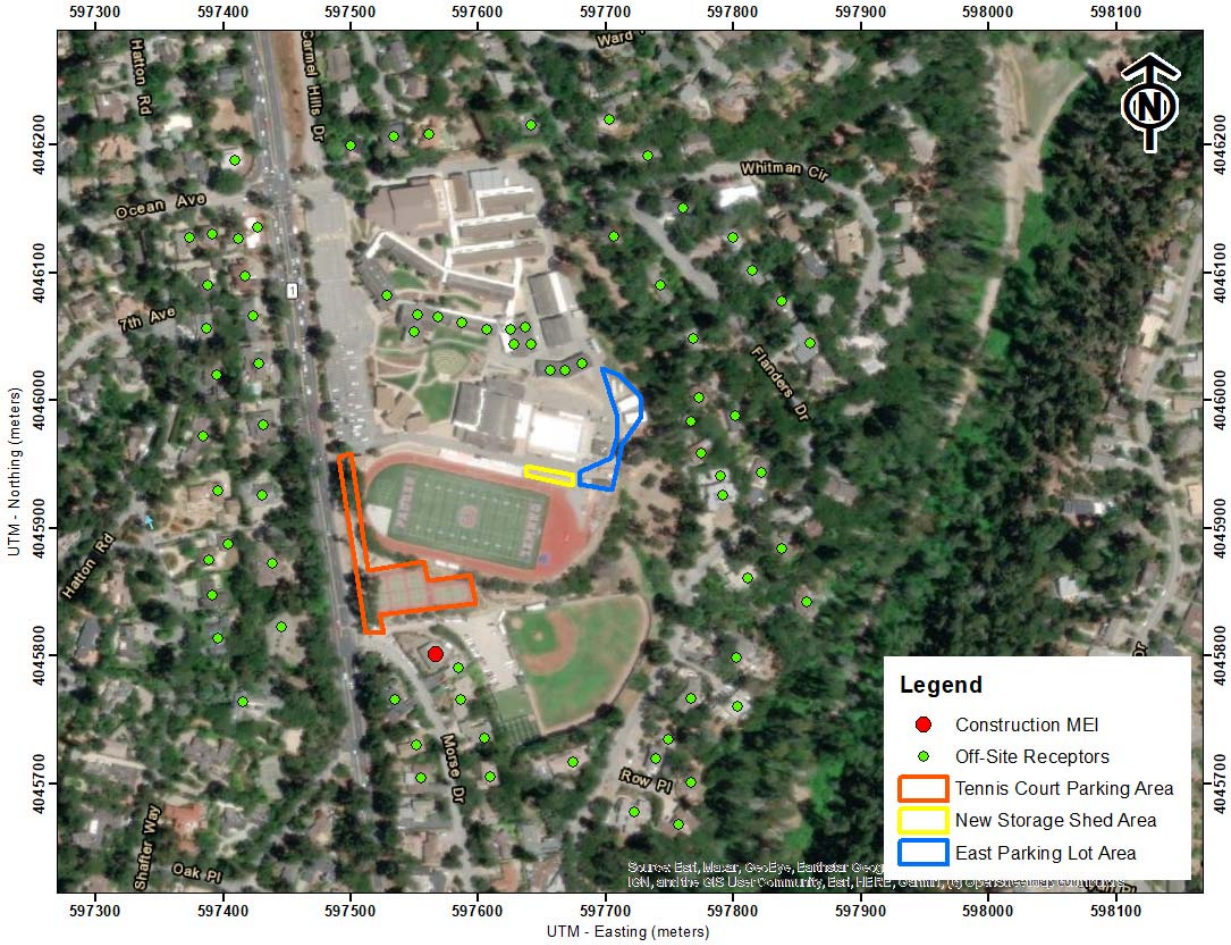
The maximum modeled annual DPM concentrations were identified at nearby sensitive receptors to find the maximally exposed individuals (MEI). Results of this assessment indicated that the construction MEI was located on the first floor (5 feet above ground) of a single-family residence to the south of the project. The location of the MEI and nearby sensitive receptors are shown in Figure 1. Table 1 summarizes the maximum cancer risks, $PM_{2.5}$ concentrations, and health hazard indexes for project related construction activities. *Attachment 2* to this report includes the emission calculations used for the construction modeling and the cancer risk calculations.

As shown in Table 1, the maximum cancer risk and HI from construction activities at the MEI location would not exceed the respective health risk significance thresholds.

Table 1. Construction Risk Impacts at the Off-Site Receptors

Source		Cancer Risk (per million)	Hazard Index
Project Construction	Unmitigated	8.16 (infant)	0.01
	Threshold	***10***	***1.0***
Exceed Threshold?	Unmitigated	*No*	*No*

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



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 is the construction health risk assessment. AERMOD dispersion modeling files for these assessments, which are quite voluminous, are available upon request and would be provided in digital format.

Attachment 1: Health Risk Calculation Methodology

A health risk assessment for exposure to 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 CARB develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[8] These guidelines incorporate methods designed to provide for enhanced protection of children, as required by State law. CARB has provided additional guidance on implementing OEHHA's recommended methods.[9] This health risk assessment used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. Current MBARD regulations/guidelines (Rule 1000 – Permit Guidelines and Requirements for Sources Emitting Toxic Air Contaminants) specify use of the most recent OEHHA guidelines when conducting health risk assessments. The new OEHHA guidelines and CARB recommended exposure parameters were used in this evaluation.

Cancer Risk

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

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day) or liters per kilogram of body weight per 8-hour period for the case of school child exposures. For this evaluation, as recommended by CARB, the 95th percentile breathing rates are used for all age groups. Additionally, CARB and the MBARD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions.

Under previous OEHHA 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

8 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.
9 CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

for ages 2 to less than 16 years, and 0.73 for ages 16 years and greater.

For an initial cancer risk estimate the fraction of time at home factors are assumed to equal one (FAH = 1.0) for the 3rd trimester, less than 2 years, and for 2 years to less than 16 years age groups. For projects with any school within the 1 in one million cancer risk isopleths (or greater) based on initial estimates a FAH = 1 should be used for the child age groups (3rd trimester, 0<2 years, and 2<16 years).

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

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

Where:

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

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

Where:

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

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

Health Risk Parameters Used for Cancer Risk Calculations

Parameter	*Exposure Type* / *Age Range*	Infant		Child	Adult
		3rd Trimester	0<2	2 < 16	16 - 30
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day) 95th Percentile Rate		361	1,090	745	335
8-hour Breathing Rate (L/kg-8 hours) 95th Percentile Rate		-	1,200	520	240
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14**
Exposure Frequency (days/year)		350	350	350	350**
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home		1.0	1.0	1.0	0.73**

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

** For worker exposures (adult) the exposure duration and frequency are 25 years 250 days/year and FAH is not applicable.

Non-Cancer Hazards

Non-cancer health risk is usually determined by comparing the predicted level of exposure to a chemical to the level of exposure that is not expected to cause any adverse effects (reference exposure level), even to the most susceptible people. Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the MBUAPCD significance threshold of a HI greater than 1.0 to determine whether a significant non-cancer health impact from a project would occur.[10]

Typically, for projects involving construction with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is DPM. For DPM, the chronic inhalation REL is 5 $\mu g/m^3$.

[10] MBUAPCD Rule 1000

Attachment 2: Construction Health Risk Assessment

Carmel High School Stadium Lighting, Carmel-by-the-Sea, CA

DPM Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2023	Tennis Lot Const	0.0147	CON_DPM	29.4	0.00896	1.13E-03	3839	2.94E-07
2023	Storage Const	0.0011	CON_DPM	2.2	0.00066	8.28E-05	282	2.94E-07
2023	East Lot Const	0.0057	CON_DPM	11.4	0.00347	4.37E-04	1486	2.94E-07
Total		***0.0215***		***43.0***	***0.0131***	***0.0016***	***5606***	

Construction Hours

hr/day =	9	(8am - 5pm)
days/yr =	365	
hours/year =	3285	

Carmel High School Stadium Lighting, Carmel-by-the-Sea, CA - Construction Health Impact Summary

Maximum Impacts at MEI Residential Location - Without Mitigation

Emissions Year	Maximum Concentrations: Exhaust PM10/DPM ($\mu g/m^3$)	Maximum Concentrations: Fugitive PM2.5 ($\mu g/m^3$)	Cancer Risk (per million): Infant/Child	Cancer Risk (per million): Adult	Hazard Index (-)
2023	0.0459	0.0662	**8.16**	**0.17**	**0.01**

Carmel High School Stadium Lighting, Carmel-by-the-Sea, 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	745	335
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, children, and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

			Infant/Child - Exposure Information			Infant/Child	Adult - Exposure Information			Adult	
							Modeled				
Exposure	Exposure Duration		DPM Conc (ug/m3)		Age Sensitivity	Cancer Risk	DPM Conc (ug/m3)		Age Sensitivity	Cancer Risk	Maximum Hazard
Year	(years)	Age	Year	Annual	Factor	(per million)	Year	Annual	Factor	(per million)	Index
0	0.25	-0.25 - 0*	2023	0.0459	10	0.62	2023	0.0459	-	-	
1	1	0 - 1	2023	0.0459	10	7.54	2023	0.0459	1	0.17	0.009
2	1	1 - 2		0.0000	10	0.00		0.0000	1	0.00	
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00	
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00	
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00	
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00	
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00	
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00	
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00	
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00	
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00	
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00	
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00	
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00	
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00	
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00	
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00	
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00	
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00	
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00	
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00	
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00	
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00	
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00	
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00	
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00	
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00	
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00	
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00	
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00	
Total Increased Cancer Risk						**8.16**				**0.17**	

* Third trimester of pregnancy

Carmel Stadium Lighting Project - Monterey County, Annual

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

Carmel Stadium Lighting Project

Monterey County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	0.90	Acre	0.90	39,204.00	0
City Park	0.10	Acre	0.10	4,356.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.6	**Precipitation Freq (Days)**	55
Climate Zone	5			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Modeled storage building as park building

Construction Phase - based on provided estimate

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	12.00
tblConstructionPhase	NumDays	2.00	12.00
tblConstructionPhase	NumDays	1.00	2.00
tblConstructionPhase	PhaseEndDate	6/21/2023	6/14/2023
tblConstructionPhase	PhaseEndDate	1/13/2023	1/17/2023
tblConstructionPhase	PhaseEndDate	1/18/2023	2/6/2023
tblConstructionPhase	PhaseEndDate	1/16/2023	1/19/2023
tblConstructionPhase	PhaseStartDate	6/15/2023	6/8/2023
tblConstructionPhase	PhaseStartDate	1/17/2023	1/20/2023
tblConstructionPhase	PhaseStartDate	1/14/2023	1/18/2023
tblGrading	AcresOfGrading	9.00	1.50
tblGrading	AcresOfGrading	1.00	0.50
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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					
2023	0.0720	0.4603	0.5075	9.6000e-004	0.0434	0.0215	0.0649	0.0191	0.0199	0.0390	0.0000	85.2568	85.2568	0.0211	1.2500e-003	86.1582
Maximum	**0.0720**	**0.4603**	**0.5075**	**9.6000e-004**	**0.0434**	**0.0215**	**0.0649**	**0.0191**	**0.0199**	**0.0390**	**0.0000**	**85.2568**	**85.2568**	**0.0211**	**1.2500e-003**	**86.1582**

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					
2023	0.0720	0.4603	0.5075	9.6000e-004	0.0434	0.0215	0.0649	0.0191	0.0199	0.0390	0.0000	85.2568	85.2568	0.0211	1.2500e-003	86.1581
Maximum	**0.0720**	**0.4603**	**0.5075**	**9.6000e-004**	**0.0434**	**0.0215**	**0.0649**	**0.0191**	**0.0199**	**0.0390**	**0.0000**	**85.2568**	**85.2568**	**0.0211**	**1.2500e-003**	**86.1581**

Carmel Stadium Lighting Project - Monterey County, Annual

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

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2023	3-31-2023	0.3105	0.3105
2	4-1-2023	6-30-2023	0.2252	0.2252
		Highest	0.3105	0.3105

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	1/1/2023	1/17/2023	5	12	
2	Site Preparation	Site Preparation	1/18/2023	1/19/2023	5	2	
3	Grading	Grading	1/20/2023	2/6/2023	5	12	
4	Building Construction	Building Construction	1/19/2023	6/7/2023	5	100	
5	Paving	Paving	6/8/2023	6/14/2023	5	5	
6	Architectural Coating	Architectural Coating	6/8/2023	6/14/2023	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 0.9

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 3,000; Non-Residential Outdoor: 1,000; Striped Parking Area: 2,352

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Grading	Graders	1	6.00	187	0.41
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	4.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	18.00	7.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

Carmel Stadium Lighting Project - Monterey County, Annual

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.8800e-003	0.0347	0.0444	7.0000e-005		1.6900e-003	1.6900e-003		1.6200e-003	1.6200e-003	0.0000	6.2509	6.2509	1.1400e-003	0.0000	6.2793
Total	**3.8800e-003**	**0.0347**	**0.0444**	**7.0000e-005**		**1.6900e-003**	**1.6900e-003**		**1.6200e-003**	**1.6200e-003**	**0.0000**	**6.2509**	**6.2509**	**1.1400e-003**	**0.0000**	**6.2793**

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	2.6000e-004	2.2000e-004	2.4500e-003	1.0000e-005	7.4000e-004	0.0000	7.5000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.6303	0.6303	2.0000e-005	2.0000e-005	0.6360
Total	**2.6000e-004**	**2.2000e-004**	**2.4500e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.5000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6303**	**0.6303**	**2.0000e-005**	**2.0000e-005**	**0.6360**

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	3.8800e-003	0.0347	0.0444	7.0000e-005		1.6900e-003	1.6900e-003		1.6200e-003	1.6200e-003	0.0000	6.2509	6.2509	1.1400e-003	0.0000	6.2793
Total	**3.8800e-003**	**0.0347**	**0.0444**	**7.0000e-005**		**1.6900e-003**	**1.6900e-003**		**1.6200e-003**	**1.6200e-003**	**0.0000**	**6.2509**	**6.2509**	**1.1400e-003**	**0.0000**	**6.2793**

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	2.6000e-004	2.2000e-004	2.4500e-003	1.0000e-005	7.4000e-004	0.0000	7.5000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.6303	0.6303	2.0000e-005	2.0000e-005	0.6360
Total	**2.6000e-004**	**2.2000e-004**	**2.4500e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.5000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6303**	**0.6303**	**2.0000e-005**	**2.0000e-005**	**0.6360**

3.3 Site Preparation - 2023

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					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Carmel Stadium Lighting Project - Monterey County, Annual

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

Off-Road	5.3000e-004	6.1900e-003	3.9200e-003	1.0000e-005		2.3000e-004	2.3000e-004		2.1000e-004	2.1000e-004	0.0000	0.8550	0.8550	2.8000e-004	0.0000	0.8619
Total	**5.3000e-004**	**6.1900e-003**	**3.9200e-003**	**1.0000e-005**	**2.7000e-004**	**2.3000e-004**	**5.0000e-004**	**3.0000e-005**	**2.1000e-004**	**2.4000e-004**	**0.0000**	**0.8550**	**0.8550**	**2.8000e-004**	**0.0000**	**0.8619**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.0000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0525	0.0525	0.0000	0.0000	0.0530
Total	**2.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0525**	**0.0525**	**0.0000**	**0.0000**	**0.0530**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.3000e-004	6.1900e-003	3.9200e-003	1.0000e-005		2.3000e-004	2.3000e-004		2.1000e-004	2.1000e-004	0.0000	0.8550	0.8550	2.8000e-004	0.0000	0.8619
Total	**5.3000e-004**	**6.1900e-003**	**3.9200e-003**	**1.0000e-005**	**2.7000e-004**	**2.3000e-004**	**5.0000e-004**	**3.0000e-005**	**2.1000e-004**	**2.4000e-004**	**0.0000**	**0.8550**	**0.8550**	**2.8000e-004**	**0.0000**	**0.8619**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	2.0000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0525	0.0525	0.0000	0.0000	0.0530
Total	**2.0000e-005**	**2.0000e-005**	**2.0000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0525**	**0.0525**	**0.0000**	**0.0000**	**0.0530**

3.4 Grading - 2023

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					0.0279	0.0000	0.0279	0.0150	0.0000	0.0150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.6000e-003	0.0611	0.0333	8.0000e-005		2.5200e-003	2.5200e-003		2.3200e-003	2.3200e-003	0.0000	7.4286	7.4286	2.4000e-003	0.0000	7.4887
Total	**5.6000e-003**	**0.0611**	**0.0333**	**8.0000e-005**	**0.0279**	**2.5200e-003**	**0.0304**	**0.0150**	**2.3200e-003**	**0.0173**	**0.0000**	**7.4286**	**7.4286**	**2.4000e-003**	**0.0000**	**7.4887**

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

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	2.1000e-004	1.7000e-004	1.9600e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5043	0.5043	1.0000e-005	1.0000e-005	0.5088
Total	**2.1000e-004**	**1.7000e-004**	**1.9600e-003**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5043**	**0.5043**	**1.0000e-005**	**1.0000e-005**	**0.5088**

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					0.0279	0.0000	0.0279	0.0150	0.0000	0.0150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.6000e-003	0.0611	0.0333	8.0000e-005		2.5200e-003	2.5200e-003		2.3200e-003	2.3200e-003	0.0000	7.4286	7.4286	2.4000e-003	0.0000	7.4887
Total	**5.6000e-003**	**0.0611**	**0.0333**	**8.0000e-005**	**0.0279**	**2.5200e-003**	**0.0304**	**0.0150**	**2.3200e-003**	**0.0173**	**0.0000**	**7.4286**	**7.4286**	**2.4000e-003**	**0.0000**	**7.4887**

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	2.1000e-004	1.7000e-004	1.9600e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5043	0.5043	1.0000e-005	1.0000e-005	0.5088
Total	**2.1000e-004**	**1.7000e-004**	**1.9600e-003**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5043**	**0.5043**	**1.0000e-005**	**1.0000e-005**	**0.5088**

3.5 Building Construction - 2023

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	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

Unmitigated Construction Off-Site

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
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	4.6000e-004	0.0166	5.4300e-003	7.0000e-005	2.0900e-003	1.0000e-004	2.1900e-003	6.0000e-004	1.0000e-004	7.0000e-004	0.0000	6.4105	6.4105	8.0000e-005	9.4000e-004	6.6919
Worker	3.8700e-003	3.2400e-003	0.0367	1.0000e-004	0.0111	7.0000e-005	0.0112	2.9600e-003	7.0000e-005	3.0200e-003	0.0000	9.4547	9.4547	2.6000e-004	2.6000e-004	9.5401
Total	**4.3300e-003**	**0.0198**	**0.0421**	**1.7000e-004**	**0.0132**	**1.7000e-004**	**0.0134**	**3.5600e-003**	**1.7000e-004**	**3.7200e-003**	**0.0000**	**15.8652**	**15.8652**	**3.4000e-004**	**1.2000e-003**	**16.2320**

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	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

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	4.6000e-004	0.0166	5.4300e-003	7.0000e-005	2.0900e-003	1.0000e-004	2.1900e-003	6.0000e-004	1.0000e-004	7.0000e-004	0.0000	6.4105	6.4105	8.0000e-005	9.4000e-004	6.6919
Worker	3.8700e-003	3.2400e-003	0.0367	1.0000e-004	0.0111	7.0000e-005	0.0112	2.9600e-003	7.0000e-005	3.0200e-003	0.0000	9.4547	9.4547	2.6000e-004	2.6000e-004	9.5401
Total	**4.3300e-003**	**0.0198**	**0.0421**	**1.7000e-004**	**0.0132**	**1.7000e-004**	**0.0134**	**3.5600e-003**	**1.7000e-004**	**3.7200e-003**	**0.0000**	**15.8652**	**15.8652**	**3.4000e-004**	**1.2000e-003**	**16.2320**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	1.1800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.7100e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

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

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

Worker	1.9000e-004	1.6000e-004	1.8400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4727	0.4727	1.0000e-005	1.0000e-005	0.4770
Total	**1.9000e-004**	**1.6000e-004**	**1.8400e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4727**	**0.4727**	**1.0000e-005**	**1.0000e-005**	**0.4770**

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	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	1.1800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.7100e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.6000e-004	1.8400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4727	0.4727	1.0000e-005	1.0000e-005	0.4770
Total	**1.9000e-004**	**1.6000e-004**	**1.8400e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4727**	**0.4727**	**1.0000e-005**	**1.0000e-005**	**0.4770**

3.7 Architectural Coating - 2023

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	0.0221					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0226**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	4.1000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1051	0.1051	0.0000	0.0000	0.1060
Total	**4.0000e-005**	**4.0000e-005**	**4.1000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1051**	**0.1051**	**0.0000**	**0.0000**	**0.1060**

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

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	0.0221					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0226**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	4.1000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1051	0.1051	0.0000	0.0000	0.1060
Total	**4.0000e-005**	**4.0000e-005**	**4.1000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1051**	**0.1051**	**0.0000**	**0.0000**	**0.1060**