

FINAL INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT / ENVIRONMENTAL IMPACT REPORT (EIS/EIR)

APPENDIX E: AIR QUALITY AND GREENHOUSE GAS METHODOLOGY AND DATA

EAST SAN PEDRO BAY ECOSYSTEM RESTORATION STUDY Long Beach, California

January 2022

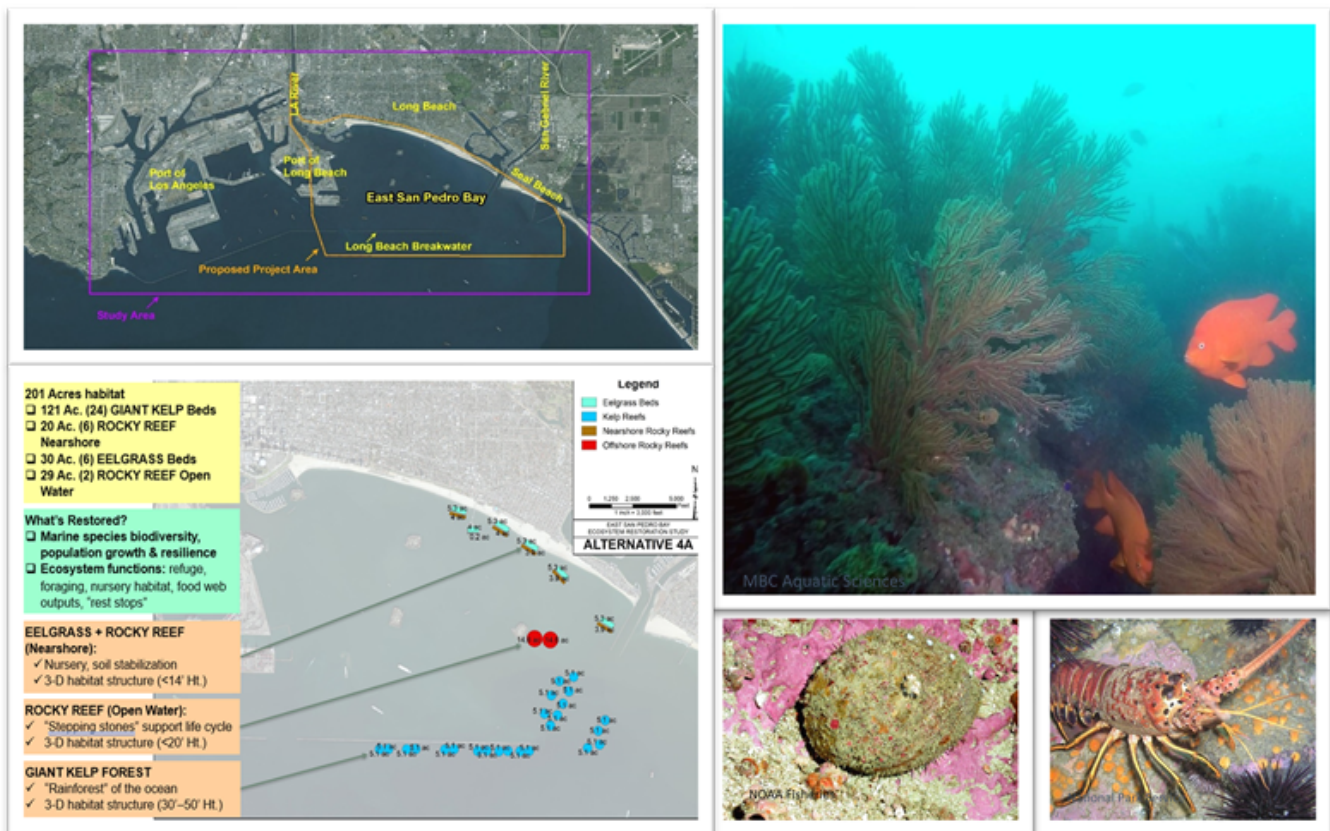


TABLE OF CONTENTS

1 AIR QUALITY METHODOLOGY1

1.1 MARINE MATERIAL-HAULING EMISSIONS 1

1.2 ON-SITE EQUIPMENT EMISSIONS 4

1.3 GENERAL CONFORMITY APPLICABILITY RATES (NEPA)..... 4

1.4 SCAQMD DAILY EMISSION THRESHOLDS (CEQA) METHODOLOGY 6

1.5 AIR TOXICS AND SENSITIVE RECEPTORS (CEQA) 7

1.6 OBJECTIONABLE ODORS (CEQA) METHODOLOGY. 7

1.7 COMPLIANCE WITH APPLICABLE AIR QUALITY PLAN (CEQA) 8

2 GREENHOUSE GASES METHODOLOGY8

2.1 10,000 MT OF CO₂E PER YEAR (CEQA) 8

ALTERNATIVE 2 MAIN AND AUXILIARY ENGINE EMISSION CALCULATORS15

ALTERNATIVE 4A MAIN AND AUXILIARY ENGINE EMISSION CALCULATORS24

ALTERNATIVE 8 MAIN AND AUXILIARY ENGINE EMISSION CALCULATORS33

List of Appendices

Appendix E-1: Air Quality Data Tables

LIST OF TABLES

TABLE 1-1: MODELING PARAMETERS FOR PROJECT ALTERNATIVES 2

TABLE 1-2: GENERAL CONFORMITY APPLICABILITY RATED IN THE SCAB 5

TABLE 1-3: MAXIMUM ANNUAL EMISSIONS (TONS PER YEAR) 6

TABLE 1-4: SIGNIFICANCE THRESHOLDS – SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT 6

TABLE 1-5: MAXIMUM DAILY EMISSIONS (POUNDS PER DAY) 7

TABLE 1-6: MAXIMUM ON-SITE DAILY EMISSIONS (POUNDS PER DAY) 7

TABLE 2-1: TOTAL MAXIMUM GHG EMISSIONS (METRIC TONS CO₂E)..... 9

TABLE 2-2: MODELING SUMMARY – DAILY CRITERIA POLLUTANT EMISSIONS..... 10

TABLE 2-3: MODELING SUMMARY – ANNUAL CRITERIA POLLUTANT EMISSIONS 12

TABLE 2-4: MODELING SUMMARY – PROJECT GREENHOUSE GAS EMISSIONS 14

1 AIR QUALITY METHODOLOGY

The air quality area of influence for the project is included in the SCAB, which consists of the urbanized areas of Los Angeles, Riverside, San Bernardino, and Orange counties, and the ocean offshore of the south coast waters.

For the purpose of this analysis, it was assumed that stone material would be imported from either Catalina Quarry and shipped in by barge, or from an inland quarry such as 3M which is located 55 miles away in Corona, California. Given those assumptions, sources of air emissions associated with various project alternatives include:

- Material-hauling emissions
 - Tugboat engine exhaust associated with hauling stone from Catalina Quarry; or
 - Vehicular emissions associations with hauling stone from 3M Quarry
- On-Site Equipment emissions
 - Tugboat and barge generators; and
 - On-deck barge construction equipment such as front-end loaders and cranes/winches

On-site emissions include activities such as stone placement and sand dredging and placement for all alternatives. On-site emissions for Alternative 8 include construction of the sandy island, oyster beds, and the wetlands. Refer to the end of this appendix for full modeling results.

Construction Phasing. Construction would be phased such that the transportation and placement of stones would occur prior to the initiation of sand dredging operations. Emission estimates were sequenced to be consistent with the general construction phasing described.

1.1 MARINE MATERIAL-HAULING EMISSIONS

Marine Hauling. Stone (armor, filter, and core) from Catalina Quarry could be used. Stone would be loaded onto flat-deck barges and tugboats would tow the barges approximately 25 nautical miles to the project area. Engine emission factors associated with harbor craft, dredges and barges were developed from CARB's most recently U.S. EPA-approved off-road emissions model. Emissions estimates were developed using the Harbor Craft, Dredge and Barge Emission Factor Calculator, Version 1.0; a calculation tool developed by the Sacramento Metropolitan Air Quality Management District's (SMAQMD).

Emissions for hauling materials from Catalina Island include emissions outside the three nautical mile limit of the SCAB encompassing the island.

Towing each barge was assumed to take 3.5 hours. The total number of towed barges was estimated based on the volume of stone and capacity of barges. The number of barges towed annually was based on the total number of barges and the duration of construction; a 1-year period was anticipated to include two-thirds of the total barges in the 90 to 113-month construction period (90 months under Alternative 2, 96 months under Alternative 4A, and 113 months under Alternative 8). Similarly, the number of barges towed daily was estimated based on the duration of construction and was rounded up to the nearest whole number.

Table 1-1: Modeling Parameters for Project Alternatives

Parameter	Alternative 2	Alternative 4A	Alternative 8
Armor/Cap Stone	137,000 tons	359,000 tons	2,079,000 tons
Filter/Fill Stone	55,000 tons	55,000 tons	92,000 tons
Core/Base Stone	252,000 tons	266,000 tons	300,000 tons
Total Quarry Stone	444,000 tons	680,000 tons	2,482,000 tons
Catalina Quarry Tugboat Deliveries	1 barge/day 106 barges	1 barge/day 183 barges	3 barge/day 338 barges
3M Quarry Truck Deliveries**	181 trips/day 177 day hauling period with deliveries every other day	181 trips/day 735 day hauling period with deliveries every other day	181 trips/day 993 day hauling period with deliveries every other day
Vessels/Equipment	Derrick Crane/Barge Tugboats Flat-Deck Barges with Cranes Front-End Loaders Winches Dredge Crew Boats Scows		
Workday	8 hours/day, except for dredging which is expected to be 22 hours/day	8 hours/day, except for dredging which is expected to be 22 hours/day	12 hours/day, except for dredging which is expected to be 22 hours/day
Sand Dredging			
Volume	100,000 cubic yards	100,000 cubic yards	3,786,000 cubic yards fill and sand 48,000 cubic yards concrete
Dredging Duration	25 days	25 days	947 days
Dredging Hours	22 hours/day	22 hours/day	22 hours/day
Tugboat Hours	20 hours/day	20 hours/day	20 hours/day
Total Construction Duration	90 months	96 months	113 months
*Construction-related emissions were estimated using 2019 emission factors. This assumption is conservative; emission factors decrease incrementally over time as newer, cleaner technologies are phased-in. **The number of truck trips per day and the total hauling period is dependent on whether a small barge would be loaded every day or a large barge would be loaded every other day. Worst-case truck delivery emissions would result from the use of a large barge every other day, so these emissions are reported in this analysis.			

CARB’s Commercial Harbor Craft Regulations were adopted in 2008 and became effective January 1, 2009 (CARB 2017). The Commercial Harbor Craft Regulations apply to all commercial harbor craft such as tugboats, towboats, ferries, barges, dredges, and fishing boats that operate in California regulated waters. The regulations also include compliance schedules for existing vessels. Because vessel engines have been retrofit subsequent to implementation of Commercial Harbor Craft Regulations in 2009 this analysis uses harbor craft emission factors for 2009 model year engines.

Truck Hauling. As an alternative to stone from the Catalina Quarry, stone from 3M Quarry in Corona, California may be used. Obtaining stone from 3M Quarry would require that stone to be loaded into heavy-duty trucks and transported 55 miles to the project staging area (Port of Long Beach Pier T), from the staging area stone would be loaded on barges and towed construction areas within the Bay. Vehicle emissions associated with material hauling were developed from CARB’s EMFAC2014, an EPA-approved on-road emissions factor model for use in California. On-road emissions estimates were modeled using SMAQMD’s Road Construction Emissions Model Version 8.1.0. It would take approximately 113 truck trips to haul enough stone to fill one small barge or 181 trips to fill one large barge. For Alternative 2, construction traffic would occur over approximately 111 to 177 days over a six-day work week, assuming one small barge is transported per day to the in-water construction sites or one large barge every other day. For Alternative 4A, construction traffic would occur over approximately 460 to 735 days over a six-day work week, assuming one small barge is transported per day to the in-water construction sites or one large barge every other day. For Alternative 8, construction traffic would occur over approximately 621 to 993 days over a six-day work week, assuming one small barge is transported per day to the in-water construction sites or one large barge every other day.

Marine Vessel Generators. Marine vessels would include tugboats, crew boats, scows, barges, and dredgers. Marine vessels were assumed to require one onboard generator on each barge (one flat-deck barge and one derrick barge). Additionally, material hauling from Catalina Quarry was assumed to require one onboard generator on each tugboat, which was assumed to be active for the 3.5-hour towing duration. Material hauling from 3M Quarry was assumed to require one onboard generator on each tugboat, which was assumed to be active for a 0.5-hour towing duration (within ESPB from the staging site to the construction area). Alternatives that include sand placement (Alternative 8) would require one additional onboard generator on each dredging vessel. As discussed previously, this analysis uses harbor craft emission factors for 2009 model year engines.

Onboard generators for tugboats were assumed to operate at full capacity while tugboats are towing barges. Onboard generators for barges would idle for much of the day while equipment is active and would only operate at full capacity as needed to power winches to reposition the barge. Thus, onboard generators for barges were assumed to operate under full load for approximately one hour per day. Additionally, the derrick barge crane motor would only operate under full load while raising stone, and would be under lesser load during disposition and repositioning. Thus, the derrick barge crane motor was also assumed to operate under full load for one hour per day.

Dredging activities would require a mechanical or hydraulic dredge, two dredging scows (barges where dredged sand is placed), and two mechanical support tugboats. For alternatives 2 and 4A, mechanical dredging equipment would be used, and for Alternative 8 hydraulic dredging equipment would be used. For air quality analysis, hydraulic dredge equipment was used in modeling emissions because this type of equipment would result in greatest air quality emissions. Onboard generator for dredging vessels would be under full load while taking in sand and then would be idle during transport, positioning, and disposition. Thus, onboard generators for dredging vessels were assumed to operate under full load approximately four hours per day.

Worker Commute. Approximately eight construction workers would be required and these workers would travel to the staging area on local roadways, adding a maximum of 16 worker commuting trips per day to local public roadways during the construction period. On-road emissions estimates were

modeled using SMAQMD’s Road Construction Emissions Model Version 8.1.0. A 40-mile one-way trip length was modeled.

1.2 ON-SITE EQUIPMENT EMISSIONS

On-Deck Equipment. Equipment emissions from front-end loaders were modeled using CARB’s most recent U.S. EPA-approved off-road emissions model. Emission estimates were calculated with SMAQMD’s Road Construction Emissions Model Version 8.1.0. Due to the nature of the work, the front-end loader would take frequent breaks while the derrick is active. The front-end loader was assumed to operate under full load approximately for two hours per day. However, as a conservative analysis, the loader was modeled for eight hours per day.

On-site emissions also include sand dredging emissions under all alternatives. Sand dredging operations emissions were estimated using hydraulic dredges powered by diesel engines using Tier 4 emission standards, hydraulic dredge equipment was used in modeling emissions because this type of equipment would result in greatest air quality emissions.

On-site equipment emissions also include emissions associated with construction of the sandy island, oyster beds, and the wetland under Alternative 8. Marine equipment emissions for the construction of these elements were estimated SMAQMD Harbor Craft, Dredge and Barge Emission Factor Calculator, Version 1.0.1.3.

1.3 GENERAL CONFORMITY APPLICABILITY RATES (NEPA)

Annual emissions for the most emission intensive year (when sand dredging would occur in the year 2034) were totaled and compared to the applicable general conformity rates in the SCAB. The SCAB encompasses three areas with different attainment designation for certain criteria pollutants: Los Angeles County, Riverside County, and Orange County.

Criteria pollutants, except for lead, that are in nonattainment or in maintenance status and their associated General Conformity applicability rates are show in Table E-1.

Table 1-2: General Conformity Applicability Rated in the SCAB

Pollutant	Los Angeles County		Riverside County		Orange County	
	Designation Category	Emission (tons/year)	Designation Category	Emission (tons/year)	Designation Category	Emission (tons/year)
Ozone (VOC as precursor)	Nonattainment (Extreme)	10	Nonattainment (Extreme)	10	Nonattainment (Extreme)	10
Ozone (NOx as precursor)	Nonattainment (Extreme)	10	Nonattainment (Extreme)	10	Nonattainment (Extreme)	10
Carbon Monoxide (CO)	Maintenance	100	Maintenance	100	Maintenance	100
Nitrogen Dioxide (NO2)	Maintenance	100	Maintenance	100	Maintenance	100
Particulate Matter (PM10)	Maintenance	100	Maintenance	100	Maintenance	100
Particulate Matter (PM2.5)	Nonattainment (Serious)	70	Nonattainment (Serious)	70	Nonattainment (Serious)	70
Lead (Pb)	Nonattainment	25	Attainment	25	Attainment	25

Sources: 40 CFR 93.53(b)(1) and 40 CFR 93.53(b)(2); EPA 2021 (California Nonattainment/Maintenance Status for Each County by Year for all Criteria Pollutants https://www3.epa.gov/airquality/greenbook/anayo_ca.html)
VOC = Volatile Organic Chemical

Onsite emissions would be located within the Los Angeles County and Orange County portion of the SCAB. Emissions associated with transportation of stones from Western Riverside County would be located within the Riverside County portion of the SCAB. Emissions associated with transportation of stones from Catalina Island would be located within the Los Angeles County portion of the SCAB. Sand dredging operations are considered part of the on-site emissions.

Estimates of lead emissions were not calculated. Lead emissions from mobile sources in California have significantly decreased due to the near elimination of lead in fuels. Emission factors developed by the U.S. Environmental Protection Agency, the California Air Resources Board, and the SCAQMD, including those in CalEEMod, the SCAQMD-approved emission modeling software, do not provide estimated emissions for lead. Little to no quantifiable and foreseeable lead emissions would be generated by the proposed action.

The construction duration for each alternative would span multiple years ranging from approximately 90 months for Alternative 2, 96 months for Alternative 4A, and to approximately 113 months for Alternative 8. Instead of reporting annual emissions for every year of construction for each alternative, only the emissions from the most intensive construction year are reported. Annual emissions for other construction years would be less. Table E-2 shows maximum annual emissions for all alternatives.

The preferred alternative (Alternative 4A) would result in emissions less than the applicable General Conformity rates. Thus, the project is not subject to a General Conformity Determination.

Table 1-3: Maximum Annual Emissions (tons per year)

Pollutant	Alternative 2		Alternative 4A		Alternative 8	
	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions
Ozone (VOC as precursor)	0.2	0.2	0.5	0.4	1.3	1.2
Ozone (NO _x as precursor)	2.5	3.4	5.4	8.0	15.8	17.9
Carbon Monoxide (CO)	2.4	2.4	4.3	3.4	20.4	19.3
Nitrogen Dioxide (NO ₂)	2.5	3.4	5.4	8.0	15.8	17.9
Particulate Matter (PM ₁₀)	0.1	0.2	0.2	0.4	0.6	0.9
Particulate Matter (PM _{2.5})	0.1	0.1	0.2	0.2	0.5	0.6

1.4 SCAQMD DAILY EMISSION THRESHOLDS (CEQA) METHODOLOGY

Maximum daily emissions were totaled and compared to SCAQMD Daily Emission Thresholds as shown in Table E-3.

Table 1-4: Significance Thresholds – South Coast Air Quality Management District

Pollutant	Mass Daily Thresholds (pounds per day)		Mass Rate Screening Thresholds (pounds per day) ¹	
	Construction	Operation	Construction	Operation
Ozone (NO _x as precursor)	100	55	179	179
Ozone (VOC as precursor)	75	55	NA	NA
Particulate Matter (PM ₁₀)	150	150	191	46
Particulate Matter (PM _{2.5})	55	55	120	29
Sulfur Oxides (SO _x)	150	150	NA	NA
Carbon Monoxide (CO)	550	550	10,198	10,198
Lead (Pb)	3	3	NA	NA

Sources: SCAQMD 2008
¹The source-receptor distance of 500 meters was conservatively selected based on the distance between nearshore rocky reef working areas and the nearest residences. The work area size of 5 acres was selected based on the size of nearshore rocky reef working areas.

For Alternatives 2 and 8, maximum daily emissions would occur during sand dredging activities. For Alternative 4A, maximum daily emissions of all pollutants except PM₁₀ and PM_{2.5} would occur during sand dredging and placement activities. Table E-4 shows maximum daily emissions for all alternatives.

Table 1-5: Maximum Daily Emissions (pounds per day)

Pollutant	Alternative 2		Alternative 4A		Alternative 8	
	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions
Ozone (VOC as precursor)	8	8	8	8	8	8
Ozone (NO _x as precursor)*	92	92	92	92	94	94
Carbon Monoxide (CO)	118	118	118	118	120	120
Sulfur Oxides (SO _x)	<1	<1	<1	<1	<1	<1
Particulate Matter (PM ₁₀)	5	5	5	5	5	5
Particulate Matter (PM _{2.5})	2	2	2	2	3	3

*Construction would be phased such that the transportation and placement of stones would occur prior to the initiation of sand dredging operations. Emission estimates were sequenced to be consistent with the general construction phasing described. The dredging operations phase would result in the highest emissions and used for the maximum daily emission.

1.5 AIR TOXICS AND SENSITIVE RECEPTORS (CEQA)

Toxic air contaminant emissions include diesel particulate matter (DPM) emissions from materials hauling and off-road equipment including marine vessels. Cancer risk from DPM exposure is a function of concentration and duration of exposure.

Hauling emissions would be generated for the duration of the project. Hauling emissions would be distributed, either along the 25-mile nautical waterway between Catalina Island Quarry and the project site or the 55 miles of roadways between 3M Quarry and the project site. As the emissions release for hauling emissions would be distributed over large areas, hauling emissions would not substantially elevate pollutant concentrations at any sensitive receptor.

Thus, toxic air contaminant emissions estimates are limited to maximum on-site daily emissions. Maximum daily emissions would occur during sand dredging and placement activities. Emissions for all alternatives were compared to mass rate screening thresholds for localized air quality impacts. Table E-5 shows maximum on-site daily emissions for all alternatives.

Table 1-6: Maximum On-Site Daily Emissions (pounds per day)

Pollutant	Alternative 2	Alternative 4A	Alternative 8	Significance Threshold (pounds/day)
Carbon Monoxide (CO)	117	117	118	10,198
Nitrogen Oxides (NO _x)	92	92	94	179
Particulate Matter (PM ₁₀)	5	5	5	191
Particulate Matter (PM _{2.5})	2	2	3	120

1.6 OBJECTIONABLE ODORS (CEQA) METHODOLOGY.

Impacts associated with objectionable odors were assessed qualitatively. They analysis considered the distance of sensitive receptors to on-site construction activities and the potential for dissipation of pollutants.

1.7 COMPLIANCE WITH APPLICABLE AIR QUALITY PLAN (CEQA)

Impacts associated with the applicable air quality plan were assessed qualitatively. The regional air quality plan, the 2016 Air Quality Management Plan (AQMP), outlines measures to reduce emissions of ozone and PM_{2.5}. The growth forecasting for the AQMP is based in part on the land uses established by local general plans. Thus, if an action is consistent with land use as designated in the local general plan, it can normally be considered consistent with the AQMP. Actions that propose a different land use than is identified in the local general plan may also be considered consistent with the AQMP if the proposed land use is less intensive than buildout under the current designation. None of the proposed alternatives would involve a change in land use designation, or would result in regional growth, and would therefore be consistent with the growth assumptions used in development of the AQMP. Thus, none of the proposed actions would obstruct or conflict with implementation of the AQMP.

2 GREENHOUSE GASES METHODOLOGY

Greenhouse gases (GHGs) are considered gases that absorb infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrochlorofluorocarbons (HCFCs), ozone (O₃), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). The Greenhouse Gas Effect phenomenon is responsible for maintaining a habitable climate on earth. Anthropogenic emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth's natural climate, known as global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses. According to the CARB website, transportation is responsible for around 41 percent of the State's greenhouse gas emissions, followed by the industrial sector (23%) and electricity generation (10%). Emissions of CO₂ and N₂O are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO₂, where CO₂ is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean. GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to the reference gas, CO₂.

Estimates of GHG emissions from all models used above were summed and converted to CO₂e, a metric measure used to compare the emissions from various greenhouse gases (CO₂, N₂O, and CH₄) on the basis of their global-warming potential, by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

2.1 10,000 MT OF CO₂E PER YEAR (CEQA)

Emissions were amortized over a period of 30 years and compared to the CEQA GHG limit of 10,000 metric tons of CO₂E per year. Table E-6 shows total GHG and 30-year amortization quantities for all alternatives.

Table 2-1: Total Maximum GHG Emissions (Metric Tons CO₂E)

	Alternative 2		Alternative 4A		Alternative 8	
	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions	Catalina Quarry & On-Site Emissions	3M Quarry & On-Site Emissions
Total GHG Emissions	1,609	2,851	5,718	8,960	8,392	14,907
GHG Emissions Amortized Over 30 Years	54	95	191	299	280	497
CEQA GHG 30-year Amortization threshold	10,000	10,000	10,000	10,000	10,000	10,000

GHG emissions from construction of Alternative 2, including dredging activities, were estimated based on the methodology described in Appendix E. Total GHG was estimated for the construction period of 90 months. If stone is imported from the Catalina Quarry, Alternative 2 would result in approximately 1,609 MT CO₂E, which is the 30-year annual equivalent of 54 MT CO₂E. If stone is imported from the 3M Quarry in Corona, Alternative 2 would result in approximately 2,851 MT CO₂E, which is the 30-year annual equivalent of 95 MT CO₂E, therefore, the 30-year annual equivalent of 10,000 MT CO₂E would not be exceeded.

GHG emissions from construction of Alternative 4A, including dredging activities, were estimated based on the methodology in Appendix E. Total GHG was estimated for the construction period of 96 months. If stone is imported from the Catalina Quarry, Alternative 4A would result in approximately 5,718 MT CO₂E, which is the 30-year annual equivalent of 191 MT CO₂E. If stone is imported from the 3M Quarry in Corona, Alternative 4A would result in approximately 8,960 MT CO₂E, which is the 30-year annual equivalent of 299 MT CO₂E, therefore, the 30-year annual equivalent of 10,000 MT CO₂E would not be exceeded.

GHG emissions from construction of Alternative 8, including dredging activities, were estimated based on the methodology in Appendix E. Total GHG was estimated for the construction period of 113 months. If stone is imported from the Catalina Quarry, Alternative 8 would result in approximately 8,392 MT CO₂E, which is the 30-year annual equivalent of 280 MT CO₂E. If stone is imported from the 3M Quarry in Corona, Alternative 8 would result in approximately 14,907 MT CO₂E, which is the 30-year annual equivalent of 497 MT CO₂E, therefore, the 30-year annual equivalent of 10,000 MT CO₂E would not be exceeded.

Table 2-2: Modeling Summary – Daily Criteria Pollutant Emissions

Alternative	Source	Description	Emissions (pounds per day)				
			ROG	NO _x	CO	PM ₁₀	PM _{2.5}
Alternative 2 Stone From Catalina Quarry	Material Hauling	Tugboat (3.5 hrs/day)	1	10	8	0	0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0	4	1	0	0
	On-Deck Equipment	Loader (8 hrs/day)	0	3	2	0	0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	8	89	115	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	2	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Employee Commute		2	18	12	1	1
	Total - On-Deck Equipment, Sand Dredging, Employee Commute		8	92	118	5	2
Alternative 2 Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	1	32	8	2	1
		Tugboat (0.5 hrs/day)	0	1	1	0	0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0	4	1	0	0
	On-Deck Equipment	Loader (8 hrs/day)	0	3	2	0	0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	8	89	115	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	2	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Employee Commute		2	41	13	3	1
Total - On-Deck Equipment, Sand Dredging, Employee Commute		8	92	118	5	2	
Alternative 4A Stone From Catalina Quarry	Material Hauling	Tugboats (2 tugs, 3.5 hrs/day)	2	21	16	1	1
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0	8	2	0	0
	On-Deck Equipment	Loader (8 hrs/day)	0	3	2	0	0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	8	89	115	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	1	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Employee Commute		3	33	21	1	1
Total - On-Deck Equipment, Sand Dredging, Employee Commute		8	92	118	5	2	
Alternative 4A Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	1	32	8	2	1
		Tugboat (2 tugboats, 0.5 hrs/day)	0	3	2	0	0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0	8	2	0	0
	On-Deck Equipment	Loader (8 hrs/day)	0	3	2	0	0

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Alternative	Source	Description	Emissions (pounds per day)				
			ROG	NO _x	CO	PM ₁₀	PM _{2.5}
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	8	89	115	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	1	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Employee Commute		2	47	15	3	1
	Total - On-Deck Equipment, Sand Dredging, Employee Commute		8	92	118	5	2
Alternative 8 Stone From Catalina Quarry	Material Hauling	Tugboats (3.5 hrs/day) (3/day)	4	31	24	1	1
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day)	0	17	4	0	0
	On-Deck Equipment	Loader (12 hrs/day)	0	4	2	0	0
	Sand Dredging (3,786,000 cy fill and sand, 48,000 cubic yards concrete)	Dredger, Tug, Crew Boat, Cement Mixer	8	90	116	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	1	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Employee Commute		5	52	32	2	1
	Total - On-Deck Equipment, Sand Dredging, Employee Commute		8	94	120	5	3
Alternative 8 - Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	1	32	8	2	1
		Tugboat (0.5 hrs/day) (3 per day)	1	4	3	0	0
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day)	0	17	4	0	0
	On-Deck Equipment	Loader (12 hrs/day)	0	4	2	0	0
	Sand Dredging (3,786,000 cy fill and sand, 48,000 cubic yards concrete)	Dredger, Tug, Crew Boat, Cement Mixer	8	90	116	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	1	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Employee Commute		3	58	19	3	2
	Total - On-Deck Equipment, Sand Dredging, Employee Commute		8	94	120	5	3

Table 2-3: Modeling Summary – Annual Criteria Pollutant Emissions

Scenario	Source	Description	Emissions (tons/year)				
			ROG	NO _x	CO	PM ₁₀	PM _{2.5}
Alternative 2 Stone From Catalina Quarry	Material Hauling	Tugboats (3.5 hrs/day) (119/year)	0.1	0.6	0.5	0.0	0.0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0.0	0.7	0.2	0.0	0.0
	On-Deck Equipment	Loader (8 hrs/day)	0.0	0.5	0.2	0.0	0.0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	0.1	0.7	1.3	0.0	0.0
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total			0.2	2.5	2.4	0.1
Alternative 2 Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	0.1	1.4	0.4	0.1	0.0
		Tugboats (0.5 hrs/day) (119/year)	0.0	0.1	0.1	0.0	0.0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0.0	0.7	0.2	0.0	0.0
	On-Deck Equipment	Loader (8 hrs/day)	0.0	0.5	0.2	0.0	0.0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	0.1	0.7	1.3	0.0	0.0
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
Total			0.2	3.4	2.4	0.2	0.1
Alternative 4A Stone From Catalina Quarry	Material Hauling	Tugboats (2 tugboats, 3.5 hrs/day) (275/year)	0.3	2.9	2.2	0.1	0.1
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0.0	1.3	0.3	0.0	0.0
	On-Deck Equipment	Loader (8 hrs/day)	0.0	0.5	0.2	0.0	0.0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	0.1	0.7	1.3	0.0	0.0
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total			0.5	5.4	4.3	0.2
Alternative 4A Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	0.2	5.1	1.2	0.4	0.1
		Tugboats (2 tugboats, 0.5 hrs/day) (275/year)	0.0	0.4	0.3	0.0	0.0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0.0	1.3	0.3	0.0	0.0
	On-Deck Equipment	Loader (8 hrs/day)	0.0	0.5	0.2	0.0	0.0

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Scenario	Source	Description	Emissions (tons/year)				
			ROG	NO _x	CO	PM ₁₀	PM _{2.5}
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	0.1	0.7	1.3	0.0	0.0
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total		0.4	8.0	3.4	0.4	0.2
Alternative 8 Stone From Catalina Quarry	Material Hauling	Tugboats (3.5 hrs/day) (662/year)	0.4	3.5	2.7	0.1	0.1
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day) Generators	0.1	2.6	0.6	0.1	0.1
	On-Deck Equipment	Loader (12 hrs/day)	0.1	0.7	0.4	0.0	0.0
	Sand Dredging (3,786,000 cy fill and sand, 48,000 cubic yards concrete)	Dredger, Tug, Crew Boat, Cement Mixer	0.7	9.0	16.5	0.4	0.3
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total		1.3	15.8	20.4	0.6	0.5
Alternative 8 Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	0.2	5.1	1.2	0.4	0.1
		Tugboats (0.5 hrs/day) (662/year)	0.1	0.5	0.4	0.0	0.0
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day) Generators	0.1	2.6	0.6	0.1	0.1
	On-Deck Equipment	Loader (12 hrs/day)	0.1	0.7	0.4	0.0	0.0
	Sand Dredging (3,786,000 cy fill and sand, 48,000 cubic yards concrete)	Dredger, Tug, Crew Boat, Cement Mixer	0.7	9.0	16.5	0.4	0.3
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
Total		1.2	17.9	19.3	0.9	0.6	

Table 2-4: Modeling Summary – Project Greenhouse Gas Emissions

Scenario	Source	Description	Total Emissions MT CO ₂ E
Alternative 2 Stone From Catalina Quarry	Material Hauling	Tugboats (3.5 hrs/day) (119/year)	160
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	212
	On-Deck Equipment	Loader (8 hrs/day)	651
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	91
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	494
	Total		
Alternative 2 Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	1,401
		Tugboats (0.5 hrs/day) (119/year)	23
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	212
	On-Deck Equipment	Loader (8 hrs/day)	651
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	91
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	494
Total			2,851
Alternative 4A Stone From Catalina Quarry	Material Hauling	Tugboats (2 tugboats, 3.5 hrs/day) (275/year)	2,917
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	1,492
	On-Deck Equipment	Loader (8 hrs/day)	695
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	91
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	523
	Total		
Alternative 4A Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	5,821
		Tugboats (2 tugboats, 0.5 hrs/day) (250/year)	338
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	1,492
	On-Deck Equipment	Loader (8 hrs/day)	695
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	91
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	523
Total			8,960
Alternative 8 Stone From Catalina Quarry	Material Hauling	Tugboats (3.5 hrs/day) (662/year)	1,571
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day) Generators	1,478
	On-Deck Equipment	Loader (12 hrs/day)	1,226

Scenario	Source	Description	Total Emissions MT CO ₂ E
	Sand Dredging (3,786,000 cy fill and sand, 48,000 cubic yards concrete)	Dredger, Tug, Crew Boat, Cement Mixer	3,515
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	602
	Total		8,392
Alternative 8 Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	7,862
		Tugboats (0.5 hrs/day) (662/year)	224
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day) Generators	1,478
	On-Deck Equipment	Loader (12 hrs/day)	1,226
	Sand Dredging (3,786,000 cy fill and sand, 48,000 cubic yards concrete)	Dredger, Tug, Crew Boat, Cement Mixer	3,515
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	602
	Total		14,907

ALTERNATIVE 2 MAIN AND AUXILIARY ENGINE EMISSION CALCULATORS

Alternative 2: Main Engine Emission Factor Calculator

Calendar Year: 2019				Number of Entries: 3							
Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdlYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of Engines
Flat-Deck Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Derrick Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Tugboat 1	Tow Boats / Push Boats	Main	A1	2009	2009	331	5	4	0.68	184.16	1

Alternative 2: Main Engine Emission Factor Calculator continued

Calendar Year: 2019				Number of Entries: 3									
Activity				Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp-hr)				
Vessel Name	Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
Flat-Deck Barge	1,776	10	17										
Derrick Barge	1,776	10	17										
Tugboat 1	1,250	10	26	0.150	0.138	5.102	0.680	3.730	0.67	0.62	0.21	0.44	0.25

Alternative 2: Emission Rates (lb/hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Flat-Deck Barge	0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
Derrick Barge	0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
Tugboat 1	0.075	0.068	2.592	0.284	2.028	0.003	293.139	0.012	0.002	294.145

Alternative 2: Emission Rates for a Single Engine (g/bhp-hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Flat-Deck Barge	0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
Derrick Barge	0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
Tugboat 1	0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005	593.1

Alternative 2: Emission Factors (g/hr) and Fuel Correction Factors

Vessel Name	Emission Factors (g/hr)									Fuel Correction Factors			
	PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
Tugboat 1	34.0	30.7	1,175.9	128.8	919.8	1.2	132,965.3	5.4	1.1	0.95	0.80	0.72	1996

Alternative 2: Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019				Number of Entries: 3							
Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of Engines
Derrick Barge	Barge/Dredge Generator	Aux	C2	2009	2009	410	7	4	0.75	185.97	1
Derrick Barge	Crane	Aux	C2	2009	2009	349	7	4	0.42	185.97	1
Tugboat 1	Tow Boats / Push Boats	Aux	A2	2009	2009	79	2	2	0.43	184.16	1

Alternative 2: Emission Rates (lb/hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Derrick Barge	0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
Derrick Barge	0.048	0.042	1.485	0.041	0.372	0.002	193.136	0.008	0.002	193.799
Tugboat 1	0.015	0.014	0.398	0.071	0.297	0.000	44.202	0.002	0.000	44.353

Alternative 2: Emission Rates for a Single Engine (g/bhp-hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Derrick Barge	0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
Derrick Barge	0.15	0.13	4.59	0.13	1.15	0.006	596.87	0.02	0.00	598.9
Tugboat 1	0.21	0.19	5.33	0.94	3.97	0.006	591.04	0.02	0.00	593.1

Alternative 2 - 3M Quarry Barge On-Deck Equipment

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	NOx lbs/day	Total			Exhaust			Fugitive Dust			SOx lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
				PM10 lbs/day	PM10 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day						
Grubbing/Land Clearing	0.30	1.55	3.18	0.11	0.11	0.00	0.10	0.10	0.00	0.01	607.24	0.20	0.01	613.78			
Grading/Excavation	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			
Drainage/Utilities/Sub-Grade	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			
Paving	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			
Maximum (pounds/day)	0.30	1.55	3.18	0.11	0.11	0.00	0.10	0.10	0.00	0.01	607.24	0.20	0.01	613.78			
Total (tons/construction project)	0.35	1.82	3.73	0.12	0.12	0.00	0.11	0.11	0.00	0.01	710.48	0.23	0.01	718.12			

Notes:
 Project Start Year ->2019; Project Length (months) ->90 ; Total Project Area (acres) ->0; Total Project Area (acres) ->0; Maximum Area Disturbed/Day (acres) ->0
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 2 - 3M Quarry Barge On-Deck Equipment

Total Emission Estimates by Phase for ->	ROG tons/phase	CO tons/phase	NOx tons/phase	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx tons/phase	CO2 tons/phase	CH4 tons/phase	N2O tons/phase	CO2e MT/phase
				PM10 tons/phase	PM10 tons/phase	PM10 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase					
Grubbing/Land Clearing	0.35	1.82	3.73	0.12	0.12	0.00	0.11	0.11	0.00	0.01	710.48	0.23	0.01	651.48
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.35	1.82	3.73	0.12	0.12	0.00	0.11	0.11	0.00	0.01	710.48	0.23	0.01	651.48
Total (tons/construction project)	0.35	1.82	3.73	0.12	0.12	0.00	0.11	0.11	0.00	0.01	710.48	0.23	0.01	651.48

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 2 - 3M Quarry Truck Hauling (via Roadways)

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	NOx lbs/day	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
				PM10 lbs/day	PM10 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day					
Project Phases (Pounds)														
Grubbing/Land Clearing	1.47	7.94	32.39	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,605.83	0.07	1.14	34,946.79
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	1.47	7.94	32.39	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,605.83	0.07	1.14	34,946.79
Total (tons/construction project)	0.06	0.35	1.43	0.10	0.10	0.00	0.04	0.04	0.00	0.01	1,529.58	0.00	0.05	1,544.65

Notes:

Project Start Year ->2019;
 Project Length (months) -> Hauling every other day over 177 day period;
 Total Project Area (acres) ->0; Total Project Area (acres) ->0;
 Maximum Area Disturbed/Day (acres) ->0
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	181	0	9,955	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Model: Road Construction Emissions Model, Version 8.1.0

Alternative 2 - 3M Quarry Truck Hauling (via Roadways)

Total Emission Estimates by Phase for ->	ROG tons/phase	CO tons/phase	NOx tons/phase	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx tons/phase	CO2 tons/phase	CH4 tons/phase	N2O tons/phase	CO2e MT/phase
				PM10 tons/phase	PM10 tons/phase	PM10 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase					
Grubbing/Land Clearing	0.06	0.35	1.43	0.10	0.10	0.00	0.04	0.04	0.00	0.01	1,529.58	0.00	0.05	1,401.30
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.06	0.35	1.43	0.10	0.10	0.00	0.04	0.04	0.00	0.01	1,529.58	0.00	0.05	1,401.30
Total (tons/construction project)	0.06	0.35	1.43	0.10	0.10	0.00	0.04	0.04	0.00	0.01	1,529.58	0.00	0.05	1,401.30

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 2 – Emission Rates for Sand Dredging Tugboat, Crew Boat, and Tier 4 Dredger

Equipment	Engine (kW)	Load Factor	Hours per Day	Days per Year	Emission Factor (g/kW-hr)								
					PM10	PM2.5	NOx	SOx	CO	VOC	CO2	CH4	N2O
Tugboat Propulsion	223	0.31	20	25	0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03
Tugboat Auxiliary	34	0.43	20	25	0.3	0.27	6.27	0.01	5	0.35	652	0.01	0.03
Crew Boat Propulsion	370	0.38	2	25	0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03
Crew Boat Auxiliary	55	0.20	2	25	0.3	0.27	7.13	0.01	5	0.35	652	0.01	0.03
T4 Dredger	600	0.50	22	25	0.04	0.036	1.8	0.0055	5	0.2	652	0.0038	0.031

Alternative 2 – Employee Commute

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	NOx lbs/day	Total		Exhaust		Fugitive Dust		SOx lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
				PM10 lbs/day	PM2.5 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM10 lbs/day	PM2.5 lbs/day					
Grubbing/Land Clearing	0.06	1.53	0.13	0.07	0.03	0.07	0.00	0.03	0.00	0.00	462.25	0.01	0.01	465.85
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.06	1.53	0.13	0.07	0.03	0.07	0.00	0.03	0.00	0.00	462.25	0.01	0.01	465.85
Total (tons/construction project)	0.08	1.78	0.15	0.08	0.03	0.08	0.00	0.03	0.00	0.01	541.83	0.01	0.01	545.04

Notes:
 Project Start Year ->2019;
 Project Length (months) ->90 ;
 Total Project Area (acres) ->0;
 Total Project Area (acres) ->0;
 Maximum Area Disturbed/Day (acres) ->0
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 2 – Employee Commute

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Total Emission Estimates by Phase for -> Project Phases (Tons for all except CO2e. Metric tons for CO2e)	ROG tons/phase	CO tons/phase	NOx tons/phase	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	Sox tons/phase	CO2 tons/phase	CH4 tons/phase	N2O tons/phase	CO2e MT/phase
				PM10 tons/phase	PM10 tons/phase	PM10 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase					
Grubbing/Land Clearing	0.08	1.78	0.15	0.08	0.08	0.00	0.03	0.03	0.00	0.01	540.83	0.01	0.01	494.46
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.08	1.78	0.15	0.08	0.08	0.00	0.03	0.03	0.00	0.01	540.83	0.01	0.01	494.46
Total (tons/construction project)	0.08	1.78	0.15	0.08	0.08	0.00	0.03	0.03	0.00	0.01	540.83	0.01	0.01	494.46

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.
Model: Road Construction Emissions Model, Version 8.1.0

ALTERNATIVE 4A MAIN AND AUXILIARY ENGINE EMISSION CALCULATORS

Alternative 4A: Main Engine Emission Factor Calculator

Calendar Year: 2019

Number of Entries: 3

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdlYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of Engines
Flat-Deck Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Derrick Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Tugboat 1	Tow Boats / Push Boats	Main	A1	2009	2009	331	5	4	0.68	184.16	1

Alternative 4A: Main Engine Emission Factor Calculator continued

Calendar Year: 2019				Number of Entries: 3									
Activity				Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp-hr)				
Vessel Name	Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	Nox	ROG	CO	PM ₁₀	PM _{2.5}	Nox	ROG	CO
Flat-Deck Barge	1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25
Derrick Barge	1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25
Tugboat 1	1,250	10	26	0.150	0.138	5.102	0.680	3.730	0.67	0.62	0.21	0.44	0.25

Alternative 4A: Emission Rates (lb/hr)

Vessel Name	Emissions										
	PM ₁₀	PM _{2.5}	Nox	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}	
Flat-Deck Barge	0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704	
Derrick Barge	0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704	
Tugboat 1	0.075	0.068	2.592	0.284	2.028	0.003	293.139	0.012	0.002	294.145	

Alternative 4A: Emission Rates for a Single Engine (g/bhp-hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	Nox	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Flat-Deck Barge	0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
Derrick Barge	0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
Tugboat 1	0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005	593.1

Alternative 4A: Emission Factors (g/hr) and Fuel Correction Factors

Vessel Name	Emission Factors (g/hr)									Fuel Correction Factors			
	PM ₁₀	PM _{2.5}	Nox	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	Nox	PM	ROG	MY Bin
Flat-Deck Barge	159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
Derrick Barge	159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
Tugboat 1	34.0	30.7	1,175.9	128.8	919.8	1.2	132,965.3	5.4	1.1	0.95	0.80	0.72	1996

Alternative 4A: Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019					Number of Entries: 2						
Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of Engines
Derrick Barge	Barge/Dredge Generator	Aux	C2	2009	2009	410	7	4	0.75	185.97	1
Derrick Barge	Crane	Aux	C2	2009	2009	349	7	4	0.42	185.97	1
Tugboat 1	Tow Boats / Push Boats	Aux	A2	2009	2009	79	2	2	0.43	184.16	1
Dredge	Crane	Aux	C2	2009	2009	349	7	4	0.42	185.97	1

Alternative 4A: Emission Rates (lb/hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	Nox	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Derrick Barge	0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
Derrick Barge	0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
Tugboat 1	0.015	0.014	0.398	0.071	0.297	0.000	44.202	0.002	0.000	44.353
Dredge	0.048	0.042	1.485	0.041	0.372	0.002	193.136	0.008	0.002	193.799

Alternative 4A: Emission Rates for a Single Engine (g/bhp-hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	Nox	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Derrick Barge	0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
Derrick Barge	0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
Tugboat 1	0.21	0.19	5.33	0.94	3.97	0.006	591.04	0.02	0.00	593.1
Dredge	0.15	0.13	4.59	0.13	1.15	0.006	596.87	0.02	0.00	598.9

Alternative 4A: 3M Quarry Barge On-Deck Equipment

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	Nox lbs/day	Total			Exhaust			Fugitive Dust			Sox lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
				PM10 lbs/day	PM10 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day						
Grubbing/Land Clearing	0.30	1.55	3.10	0.10	0.10	0.00	0.10	0.10	0.00	0.00	0.00	0.01	607.14	0.20	0.01	613.68	
Grading/Excavation	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	
Drainage/Utilities/Sub-Grade	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	
Paving	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	
Maximum (pounds/day)	0.30	1.55	3.10	0.10	0.10	0.00	0.10	0.10	0.00	0.00	0.01	607.14	0.20	0.01	613.68		
Total (tons/construction project)	0.37	1.93	3.87	0.13	0.13	0.00	0.12	0.12	0.00	0.01	757.71	0.24	0.01	765.87			

Notes:
 Project Start Year ->2019;
 Project Length (months) ->96;
 Total Project Area (acres) ->0;
 Total Project Area (acres) ->0;
 Maximum Area Disturbed/Day (acres) ->0;
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 4A: 3M Quarry Barge On-Deck Equipment

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Total Emission Estimates by Phase for -> Project Phases (Tons for all except CO2e. Metric tons for CO2e)	ROG tons/phase	CO tons/phase	NOx tons/phase	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx tons/phase	CO2 tons/phase	CH4 tons/phase	N2O tons/phase	CO2e MT/phase
				PM10 tons/phase	PM10 tons/phase	PM10 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase					
Grubbing/Land Clearing	0.37	1.93	3.87	0.13	0.13	0.00	0.12	0.12	0.00	0.01	757.71	0.24	0.01	694.80
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.37	1.93	3.87	0.13	0.13	0.00	0.12	0.12	0.00	0.01	757.71	0.24	0.01	694.80
Total (tons/construction project)	0.37	1.93	3.87	0.13	0.13	0.00	0.12	0.12	0.00	0.01	757.71	0.24	0.01	694.80

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 4A: 3M Quarry Truck Hauling (via Roadways)

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	NOx lbs/day	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
				PM10 lbs/day	PM10 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day					
Project Phases (Pounds)														
Grubbing/Land Clearing	1.47	7.96	32.35	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,587.4 1	0.07	1.14	34,928.19
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	1.47	7.96	32.35	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,587.4 1	0.07	1.14	34,928.19
Total (tons/construction project)	0.27	1.46	5.94	0.41	0.41	0.00	0.16	0.16	0.00	0.06	6,353.36	0.01	0.21	6,415.96

Notes:

Project Start Year ->2019
 Project Length (months) -> Hauling every other day over 735 day period
 Total Project Area (acres) ->0
 Total Project Area (acres) ->0
 Maximum Area Disturbed/Day (acres) ->0
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	181	0	9,955	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Model: Road Construction Emissions Model, Version 8.1.0

Alternative 4A: 3M Quarry Truck Hauling (via Roadways)

Total Emission Estimates by Phase for ->	ROG tons/phase	CO tons/phase	NOx tons/phase	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx tons/phase	CO2 tons/phase	CH4 tons/phase	N2O tons/phase	CO2e MT/phase
				PM10 tons/phase	PM10 tons/phase	PM10 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase					
Grubbing/Land Clearing	0.27	1.46	5.94	0.41	0.41	0.00	0.16	0.16	0.00	0.06	6,353.36	0.01	0.21	5,820.52
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.27	1.46	5.94	0.41	0.41	0.00	0.16	0.16	0.00	0.06	6,353.36	0.01	0.21	5,820.52
Total (tons/construction project)	0.27	1.46	5.94	0.41	0.41	0.00	0.16	0.16	0.00	0.06	6,353.36	0.01	0.21	5,820.52

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 4A – Emission Rates for Sand Dredging Tugboat, Crew Boat, and Tier 4 Dredger

Equipment	Engine (kW)	Load Factor	Hours per Day	Days per Year	Emission Factor (g/kW-hr)								
					PM10	PM2.5	NOx	SOx	CO	VOC	CO2	CH4	N2O
Tugboat Propulsion	223	0.31	20	25	0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03
Tugboat Auxiliary	34	0.43	20	25	0.3	0.27	6.27	0.01	5	0.35	652	0.01	0.03
Crew Boat Propulsion	370	0.38	2	25	0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03
Crew Boat Auxiliary	55	0.20	2	25	0.3	0.27	7.13	0.01	5	0.35	652	0.01	0.03
T4 Dredger	600	0.50	22	25	0.04	0.036	1.8	0.0055	5	0.2	652	0.0038	0.031

Alternative 4A – Employee Commute

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	NOx lbs/day	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
---------------------------------	-------------	------------	-------------	-------	---------	---------------	-------	---------	---------------	-------------	-------------	-------------	-------------	--------------

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Project Phases (Pounds)				PM10 lbs/day	PM10 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day					
Grubbing/Land Clearing	0.06	1.50	0.13	0.07	0.07	0.00	0.03	0.03	0.00	0.00	458.70	0.01	0.01	462.23
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.06	1.50	0.13	0.07	0.07	0.00	0.03	0.03	0.00	0.00	458.70	0.01	0.01	462.23
Total (tons/construction project)	0.08	1.87	0.16	0.08	0.08	0.00	0.03	0.03	0.00	0.01	572.46	0.01	0.01	576.87

Notes:
 Project Start Year ->2019;
 Project Length (months) ->96;
 Total Project Area (acres) ->0;
 Total Project Area (acres) ->0;
 Maximum Area Disturbed/Day (acres) ->0
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 4A – Employee Commute

Total Emission Estimates by Phase for ->	ROG tons/phase			Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust					
--	----------------	--	--	-------	---------	---------------	-------	---------	---------------	--	--	--	--	--

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Project Phases (Tons for all except CO2e. Metric tons for CO2e)		CO tons/ phase	NOx tons/ phase	PM10 tons/ phase	PM10 tons/ phase	PM10 tons/ phase	PM2.5 tons/ phase	PM2.5 tons/ phase	PM2.5 tons/ phase	Sox tons/ phase	CO2 tons/ phase	CH4 tons/ phase	N2O tons/ phase	CO2e MT/ phase
Grubbing/Land Clearing	0.08	1.87	0.16	0.08	0.08	0.00	0.03	0.03	0.00	0.01	572.46	0.01	0.01	523.33
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.08	1.87	0.16	0.08	0.08	0.00	0.03	0.03	0.00	0.01	572.46	0.01	0.01	523.33
Total (tons/construction project)	0.08	1.87	0.16	0.08	0.08	0.00	0.03	0.03	0.00	0.01	572.46	0.01	0.01	523.33
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified. Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K. CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs. The CO2e emissions are reported as metric tons per phase. Model: Road Construction Emissions Model, Version 8.1.0														

ALTERNATIVE 8 MAIN AND AUXILIARY ENGINE EMISSION CALCULATORS

Alternative 8: Main Engine Emission Factor Calculator

Calendar Year: 2019				Number of Entries: 4							
Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of Engines
Flat-Deck Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Derrick Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Dredger	Dredge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Tugboat 1	Tow Boats / Push Boats	Main	A1	2009	2009	331	5	4	0.68	184.16	1

Alternative 8: Main Engine Emission Factor Calculator continued

Calendar Year: 2019				Number of Entries: 3									
Activity				Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp-hr)				
Vessel Name	Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NO _x	ROG	CO	PM ₁₀	PM _{2.5}	NO _x	ROG	CO
Flat-Deck Barge	1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25
Derrick Barge	1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25
Tugboat 1	1,250	10	26	0.150	0.138	5.102	0.680	3.730	0.67	0.62	0.21	0.44	0.25

Alternative 8: Emission Rates (lb/hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Flat-Deck Barge	0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
Derrick Barge	0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
Dredge	0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
Tugboat 1	0.075	0.068	2.592	0.284	2.028	0.003	293.139	0.012	0.002	294.145

Alternative 8: Emission Rates (lb/hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO _{2e}
Flat-Deck Barge	0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
Derrick Barge	0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
Dredge	0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
Tugboat 1	0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005	593.1

Alternative 8: Emission Factors (g/hr) and Fuel Correction Factors

Vessel Name	Emission Factors (g/hr)									Fuel Correction Factors			
	PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
Flat-Deck Barge	159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
Derrick Barge	159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
Dredge	159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
Tugboat 1	34.0	30.7	1,175.9	128.8	919.8	1.2	132,965.3	5.4	1.1	0.95	0.80	0.72	1996

Alternative 8: Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019				Number of Entries: 4							
Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of Engines
Derrick Barge	Barge/Dredge Generator	Aux	C2	2009	2009	410	7	4	0.75	185.97	1
Derrick Barge	Crane	Aux	C2	2009	2009	349	7	4	0.42	185.97	1
Dredge	Dredge	Dredge		2009	2009	425			0.51		1
Tugboat 1	Tow Boats / Push Boats	Aux	A2	2009	2009	79	2	2	0.43	184.16	1

Alternative 8: Emission Rates (lb/hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Derrick Barge	0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
Derrick Barge	0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
Dredge	0.060	0.054	2.050	0.053	0.508	0.003	285.215	0.012	0.002	286.193
Tugboat 1	0.015	0.014	0.398	0.071	0.297	0.000	44.202	0.002	0.000	44.353

Alternative 8: Emission Rates for a Single Engine (g/bhp-hr)

Vessel Name	Emissions									
	PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
Derrick Barge	0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
Derrick Barge	0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
Dredge	0.12	0.11	4.29	0.11	1.06	0.006	596.87	0.02	0.00	598.9
Tugboat 1	0.21	0.19	5.33	0.94	3.97	0.006	591.04	0.02	0.00	593.1

Alternative 8: 3M Quarry Barge On-Deck Equipment

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	NOx lbs/day	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
				PM10 lbs/day	PM10 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day					
Grubbing/Land Clearing	0.43	2.31	4.37	0.15	0.15	0.00	0.13	0.13	0.00	0.01	910.37	0.29	0.01	920.18
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.43	2.31	4.37	0.15	0.15	0.00	0.13	0.13	0.00	0.01	910.37	0.29	0.01	920.18
Total (tons/construction project)	0.63	3.39	6.42	0.21	0.21	0.00	0.20	0.20	0.00	0.01	1,337.34	0.43	0.01	1,351.74

Notes:
 Project Start Year ->2019; Project Length (months) -> 113; Total Project Area (acres) ->0;
 Total Project Area (acres) ->0 ;
 Maximum Area Disturbed/Day (acres) ->0;
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 8: 3M Quarry Barge On-Deck Equipment

Total Emission Estimates by Phase for -> Project Phases (Tons for all except CO2e. Metric tons for CO2e)	ROG tons/phase	CO tons/ phase	NOx tons/ phase	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx tons/ phase	CO2 tons/ phase	CH4 tons/ phase	N2O tons/ phase	CO2e MT/ phase
				PM10 tons/ phase	PM10 tons/ phase	PM10 tons/ phase	PM2.5 tons/ phase	PM2.5 tons/ phase	PM2.5 tons/ phase					
Grubbing/Land Clearing	0.63	3.39	6.42	0.21	0.21	0.00	0.20	0.20	0.00	0.01	1,337.34	0.43	0.01	1,226.29
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.63	3.39	6.42	0.21	0.21	0.00	0.20	0.20	0.00	0.01	1,337.34	0.43	0.01	1,226.29
Total (tons/construction project)	0.63	3.39	6.42	0.21	0.21	0.00	0.20	0.20	0.00	0.01	1,337.34	0.43	0.01	1,226.29

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 8: 3M Quarry Truck Hauling (via Roadways)

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	NOx lbs/day	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
				PM10 lbs/day	PM10 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day					
Project Phases (Pounds)														
Grubbing/Land Clearing	1.47	7.98	32.29	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,560.89	0.07	1.14	34,901.41
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	1.47	7.98	32.29	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,560.89	0.07	1.14	34,901.41
Total (tons/construction project)	0.36	1.98	8.02	0.56	0.56	0.00	0.22	0.22	0.00	0.08	8,581.47	0.02	0.28	8,666.02

Notes:

Project Start Year ->2019;
 Project Length (months) ->Hauling every other day over 993 day period;
 Total Project Area (acres) ->0;
 Total Project Area (acres) ->0;
 Maximum Area Disturbed/Day (acres) ->0;
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	181	0	9,955	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Model: Road Construction Emissions Model, Version 8.1.0

Alternative 8: 3M Quarry Truck Hauling (via Roadways)

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Total Emission Estimates by Phase for -> Project Phases (Tons for all except CO2e. Metric tons for CO2e)	ROG tons/phase	CO tons/phase	NOx tons/phase	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx tons/phase	CO2 tons/phase	CH4 tons/phase	N2O tons/phase	CO2e MT/phase
				PM10 tons/phase	PM10 tons/phase	PM10 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase					
Grubbing/Land Clearing	0.36	1.98	8.02	0.56	0.56	0.00	0.22	0.22	0.00	0.08	8,581.47	0.02	0.28	7,861.76
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.36	1.98	8.02	0.56	0.56	0.00	0.22	0.22	0.00	0.08	8,581.47	0.02	0.28	7,861.76
Total (tons/construction project)	0.36	1.98	8.02	0.56	0.56	0.00	0.22	0.22	0.00	0.08	8,581.47	0.02	0.28	7,861.76

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.
Model: Road Construction Emissions Model, Version 8.1.0

Alternative 8 – Emission Rates for Sand Dredging Tugboat, Crew Boat, and Tier 4 Dredger

Equipment	Engine (hp or kW)	Load Factor	Hours per Day	Days per Year	Emission Factor (g/hp-hr, g/kW-hr)								
					PM10	PM2.5	NOx	SOx	CO	VOC	CO2	CH4	N2O
Cement and Mortar Mixer	9	0.56	22	313	0.16	0.16	4.14	0.008	3.46	0.49	568	0.059	0.005
Tugboat Propulsion	223 kW	0.31	20	313	0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03
Tugboat Auxiliary	34 kW	0.43	20	313	0.3	0.27	6.27	0.01	5	0.35	652	0.01	0.03
Crew Boat Propulsion	370 kW	0.38	2	313	0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03
Crew Boat Auxiliary	55 kW	0.20	2	313	0.3	0.27	7.13	0.01	5	0.35	652	0.01	0.03
T4 Dredger	600 kW	0.50	22	313	0.04	0.036	1.8	0.0055	5	0.2	652	0.0038	0.031

Alternative 8 – Employee Commute

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Daily Emission Estimates for ->	ROG lbs/day	CO lbs/day	NOx lbs/day	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	SOx lbs/day	CO2 lbs/day	CH4 lbs/day	N2O lbs/day	CO2e lbs/day
				PM10 lbs/day	PM10 lbs/day	PM10 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day	PM2.5 lbs/day					
Grubbing/Land Clearing	0.06	1.43	0.12	0.07	0.07	0.00	0.03	0.03	0.00	0.00	448.20	0.01	0.01	451.55
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.06	1.43	0.12	0.07	0.07	0.00	0.03	0.03	0.00	0.00	448.20	0.01	0.01	451.55
Total (tons/construction project)	0.09	2.10	0.17	0.10	0.10	0.00	0.04	0.04	0.00	0.01	658.42	0.01	0.02	663.33

Notes:
 Project Start Year ->2019;
 Project Length (months) ->113;
 Total Project Area (acres) ->0;
 Total Project Area (acres) ->0;
 Maximum Area Disturbed/Day (acres) ->0
 Water Truck Used? ->No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO₂, CH₄ and N₂O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Model: Road Construction Emissions Model, Version 8.1.0

Alternative 8 – Employee Commute

East San Pedro Bay Ecosystem Restoration Study – Appendix E: Air Quality

Total Emission Estimates by Phase for -> Project Phases (Tons for all except CO2e. Metric tons for CO2e)	ROG tons/phase	CO tons/phase	NOx tons/phase	Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust	Sox tons/phase	CO2 tons/phase	CH4 tons/phase	N2O tons/phase	CO2e MT/phase
				PM10 tons/phase	PM10 tons/phase	PM10 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase	PM2.5 tons/phase					
Grubbing/Land Clearing	0.09	2.10	0.17	0.10	0.10	0.00	0.04	0.04	0.00	0.01	658.42	0.01	0.02	601.77
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.09	2.10	0.17	0.10	0.10	0.00	0.04	0.04	0.00	0.01	658.42	0.01	0.02	601.77
Total (tons/construction project)	0.09	2.10	0.17	0.10	0.10	0.00	0.04	0.04	0.00	0.01	658.42	0.01	0.02	601.77

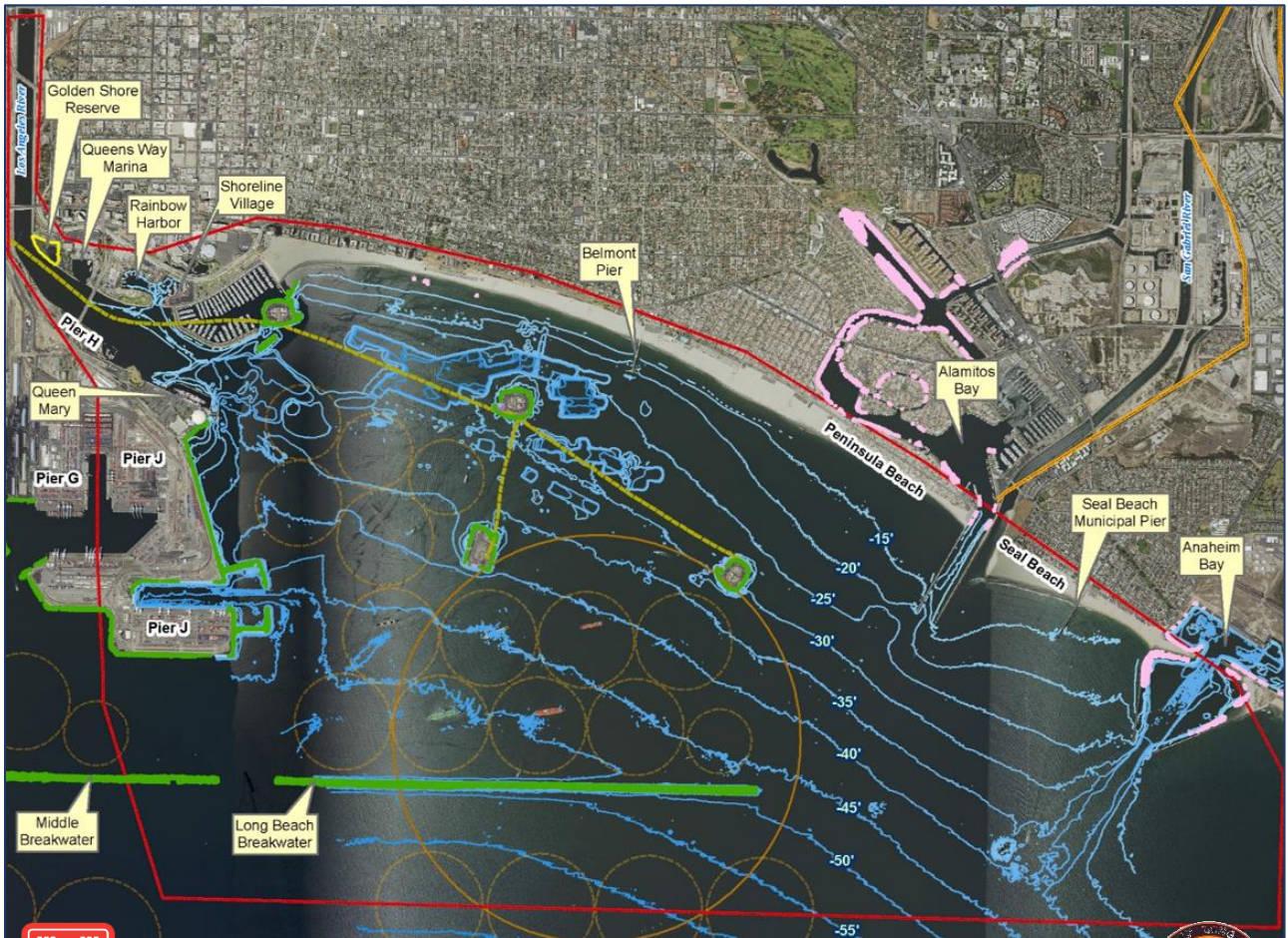
PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H.
 Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively.
 Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.
Model: Road Construction Emissions Model, Version 8.1.0

EAST SAN PEDRO BAY ECOSYSTEM RESTORATION STUDY

Long Beach, California

Appendix E-1

Air Quality



US Army Corps
of Engineers®

January 2022



Modeling Summary - Annual Criteria Pollutant Emissions

Scenario	Source	Description	Emissions (tons/year)				
			ROG	NO _x	CO	PM ₁₀	PM _{2.5}
Alternative 2 Stone From Catalina Quarry	Material Hauling	Tug Boats (3.5 hrs/day) (119/year)	0.1	0.6	0.5	0.0	0.0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0.0	0.7	0.2	0.0	0.0
	On-Deck Equipment	Loader (8 hrs/day)	0.0	0.5	0.2	0.0	0.0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	0.1	0.7	1.3	0.0	0.0
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total			0.2	2.5	2.4	0.1
Alternative 2 Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day, 88.5 days); (110 miles/trip)	0.1	1.4	0.4	0.1	0.0
		Tug Boats (0.5 hrs/day) (119/year)	0.0	0.1	0.1	0.0	0.0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0.0	0.7	0.2	0.0	0.0
	On-Deck Equipment	Loader (8 hrs/day)	0.0	0.5	0.2	0.0	0.0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	0.1	0.7	1.3	0.0	0.0
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total			0.2	3.4	2.4	0.2
Alternative 4A Stone From Catalina Quarry	Material Hauling	Tug Boats (2 tugs, 3.5 hrs/day) (275/year)	0.3	2.9	2.2	0.1	0.1
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0.0	1.3	0.3	0.0	0.0
	On-Deck Equipment	Loader (8 hrs/day)	0.0	0.5	0.2	0.0	0.0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	0.1	0.7	1.3	0.0	0.0
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total			0.5	5.4	4.3	0.2
Alternative 4A Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day, 367.5 days); (110 miles/trip)	0.2	5.1	1.2	0.4	0.1
		Tug Boats (2 tugs, 0.5 hrs/day) (275/year)	0.0	0.4	0.3	0.0	0.0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0.0	1.3	0.3	0.0	0.0
	On-Deck Equipment	Loader (8 hrs/day)	0.0	0.5	0.2	0.0	0.0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	0.1	0.7	1.3	0.0	0.0
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total			0.4	8.0	3.4	0.4
Alternative 8 Stone From Catalina Quarry	Material Hauling	Tug Boats (3.5 hrs/day) (662/year)	0.4	3.5	2.7	0.1	0.1
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day) Generators	0.1	2.6	0.6	0.1	0.1
	On-Deck Equipment	Loader (12 hrs/day)	0.1	0.7	0.4	0.0	0.0
	Sand Dredging (3,786,000 cy)	Dredger, Tug, Crew Boat, Cement Mixer	0.7	9.0	16.5	0.4	0.3
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total			1.3	15.8	20.4	0.6
Alternative 8 - Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day, 496.5 days); (110 miles/trip)	0.2	5.1	1.2	0.4	0.1
		Tug Boats (0.5 hrs/day) (662/year)	0.1	0.5	0.4	0.0	0.0
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day) Generators	0.1	2.6	0.6	0.1	0.1
	On-Deck Equipment	Loader (12 hrs/day)	0.1	0.7	0.4	0.0	0.0
	Sand Dredging (3,786,000 cy)	Dredger, Tug, Crew Boat, Cement Mixer	0.7	9.0	16.5	0.4	0.3
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0.0	0.0	0.2	0.0	0.0
	Total			1.2	17.9	19.3	0.9

Modeling Summary - Daily Criteria Pollutant Emissions

Scenario	Source	Description	Emissions (pounds per day)					
			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Alternative 2 Stone From Catalina Quarry	Material Hauling	Tug Boat (3.5 hrs/day)	1	10	8	0	0	0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0	4	1	0	0	0
	On-Deck Equipment	Loader (8 hrs/day)	0	3	2	0	0	0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	8	89	115	0	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	2	0	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Workers		2	18	12	0	1	1
	Total - On-Deck Equipment, Sand Dredging, Workers		8	92	118	0	5	2
Alternative 2 Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	1	32	8	0	2	1
		Tug Boat (0.5 hrs/day)	0	1	1	0	0	0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0	4	1	0	0	0
	On-Deck Equipment	Loader (8 hrs/day)	0	3	2	0	0	0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	8	89	115	0	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	2	0	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Workers		2	41	13	0	3	1
Total - On-Deck Equipment, Sand Dredging, Workers		8	92	118	0	5	2	
Alternative 4A Stone From Catalina Quarry	Material Hauling	Tug Boats (2 tugs, 3.5 hrs/day) (275/year)	2	21	16	0	1	1
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0	8	2	0	0	0
	On-Deck Equipment	Loader (8 hrs/day)	0	3	2	0	0	0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	8	89	115	0	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	1	0	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Workers		3	33	21	0	1	1
	Total - On-Deck Equipment, Sand Dredging, Workers		8	92	118	0	5	2
Alternative 4A Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	1	32	8	0	2	1
		Tug Boats (2 tugs, 0.5 hrs/day) (275/year)	0	3	2	0	0	0
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	0	8	2	0	0	0
	On-Deck Equipment	Loader (8 hrs/day)	0	3	2	0	0	0
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	8	89	115	0	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	1	0	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Workers		2	47	15	0	3	1
Total - On-Deck Equipment, Sand Dredging, Workers		8	92	118	0	5	2	
Alternative 8 Stone From Catalina Quarry	Material Hauling	Tug Boats (3.5 hrs/day) (3/day)	4	31	24	0	1	1
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day)	0	17	4	0	0	0
	On-Deck Equipment	Loader (12 hrs/day)	0	4	2	0	0	0
	Sand Dredging (3,786,000 cy)	Dredger, Tug, Crew Boat, Cement Mixer	8	90	116	0	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	1	0	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Workers		5	52	32	0	2	1
	Total - On-Deck Equipment, Sand Dredging, Workers		8	94	120	0	5	3
Alternative 8 - Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day); (110 miles/trip)	1	32	8	0	2	1
		Tug Boat (0.5 hrs/day) (3 per day)	1	4	3	0	0	0
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day)	0	17	4	0	0	0
	On-Deck Equipment	Loader (12 hrs/day)	0	4	2	0	0	0
	Sand Dredging (3,786,000 cy)	Dredger, Tug, Crew Boat, Cement Mixer	8	90	116	0	5	2
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	0	0	1	0	0	0
	Total - Hauling, Vessels, On-Deck Equipment, Workers		3	58	19	0	3	2
Total - On-Deck Equipment, Sand Dredging, Workers		8	94	120	0	5	3	

East San Pedro Bay Ecosystem Restoration Study
Modeling Summary - Total Construction-Related GHG Emissions
Alternatives 2, 4A, 8

Modeling Summary - Project GHG Emissions

Scenario	Source	Description	Emissions MT CO ₂ E
Alternative 2 Stone From Catalina Quarry	Material Hauling	Tug Boats (3.5 hrs/day) (119/year)	160
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	212
	On-Deck Equipment	Loader (8 hrs/day)	651
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	91
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	494
	Total		
Alternative 2 Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day, 88.5 days); (110 miles/trip)	1,401
		Tug Boats (0.5 hrs/day) (119/year)	23
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	212
	On-Deck Equipment	Loader (8 hrs/day)	651
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	91
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	494
Total			2,851
Alternative 4A Stone From Catalina Quarry	Material Hauling	Tug Boats (2 tugs, 3.5 hrs/day) (2,714 days)	2,917
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	1,492
	On-Deck Equipment	Loader (8 hrs/day)	695
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	91
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	523
	Total		
Alternative 4A Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day, 367.5 days); (110 miles/trip)	5,821
		Tug Boats (2 tugs, 0.5 hrs/day) (275/year)	338
	Vessel Engines/Generators	Barge Crane and Generator (1 hr/day)	1,492
	On-Deck Equipment	Loader (8 hrs/day)	695
	Sand Dredging (100,000 cy)	Dredger, Tug, Crew Boat	91
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	523
Total			8,960
Alternative 8 Stone From Catalina Quarry	Material Hauling	Tug Boats (3.5 hrs/day) (662/year)	1,571
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day) Generators	1,478
	On-Deck Equipment	Loader (12 hrs/day)	1,226
	Sand Dredging (3,786,000 cy)	Dredger, Tug, Crew Boat, Cement Mixer	3,515
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	602
	Total		
Alternative 8 - Stone From 3M Quarry	Material Hauling	Trucks (181 trips/day, 496.5 days); (110 miles/trip)	7,862
		Tug Boats (0.5 hrs/day) (662/year)	224
	Vessel Engines/Generators	Barge (1.5 hr/day) and Dredge (4 hrs/day) Generators	1,478
	On-Deck Equipment	Loader (12 hrs/day)	1,226
	Sand Dredging (3,786,000 cy)	Dredger, Tug, Crew Boat, Cement Mixer	3,515
	Employee Commute	Vehicles (16 trips/day, 40 mile trip length)	602
Total			14,907

[This page was intentionally left blank]

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Input Data Page

INSTRUCTIONS:
 1. Enter inputs into tables A1, A2, A3, and A4 below. Required inputs must be entered to estimate emission rates, optional inputs should be entered if available.
 2. After entering inputs, review status and error messages (cell E14); make changes as necessary until this cell is green indicating that inputs are ready.
 3. Results may be reviewed in "MainEngineEmissRates" and "AuxEngineEmissRates" tabs, both colored yellow.

Inputs and Status

Inputs color legend	Required Input
	Optional Input
Status and error messages	OK. Default values will be applied to blank model year and HP

A1. Inventory Calendar year

Inventory Calendar Year	2019
-------------------------	------

A2. Main Engine Inputs

Required Inputs			Optional Inputs			
Vessel Name	Vessel Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)	Vessel Number	Home Port
Tug Boat 1	Tow Boats / Push Boats	1	2009			

A4. Project Information

Inputs	
Date (mm/dd/yyyy):	1/1/2019
Project Name:	Barge Hauling
Project Location:	Long Beach
Contact Person:	
Company Name:	
Mailing Address:	
Phone Number:	
Email Address:	

A3. Auxiliary Engine Inputs

Required Inputs			Optional Inputs	
Vessel Name	Auxiliary Engine Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)
Tug Boat 1	Tow Boats / Push Boats Genera	1	2009	

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Main Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Tug Boat 1	Tow Boats / Push Boats	Main	A1	2009	2009	331	5	4	0.68	184.16	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
1,250	10	26	0.150	0.138	5.102	0.680	3.730	0.67	0.62	0.21	0.44	0.25

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 2

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
34.0	30.7	1,175.9	128.8	919.8	1.2	132,965.3	5.4	1.1	0.95	0.80	0.72	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Tug Boat 1	Tow Boats / Push Boats	Aux	A2	2009	2009	79	2	2	0.43	184.16	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
1,633	10	25	0.220	0.202	5.320	1.178	3.730	0.44	0.40	0.14	0.28	0.16

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.207	0.188	5.326	0.943	3.969	0.006	591.045	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 2

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
7.0	6.4	180.7	32.0	134.6	0.2	20,049.5	0.8	0.2	0.9	0.8	0.7	1998

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Main Engine Emission Rates

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information							
Vessel Name	Vessel Number	Home Port	Vessel Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of engines
Tug Boat 1			Tow Boats / Push Boats	2009	331	0.68	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column J for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.075	0.068	2.592	0.284	2.028	0.003	293.139	0.012	0.002	294.145

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005	593.1

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Auxiliary Engine Emission Rates

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information								
Vessel Name	Vessel Number	Home Port	Vessel Type	Auxiliary Engine Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of Engines
Tug Boat 1			Tow Boats / Push Boats	Tow Boats / Push Boats Generator	2009	79	0.43	1

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column K for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.015	0.014	0.398	0.071	0.297	0.000	44.202	0.002	0.000	44.353

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.21	0.19	5.33	0.94	3.97	0.006	591.04	0.02	0.00	593.1

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Input Data Page

INSTRUCTIONS:
 1. Enter inputs into tables A1, A2, A3, and A4 below. Required inputs must be entered to estimate emission rates, optional inputs should be entered if available.
 2. After entering inputs, review status and error messages (cell E14); make changes as necessary until this cell is green indicating that inputs are ready.
 3. Results may be reviewed in "MainEngineEmissRates" and "AuxEngineEmissRates" tabs, both colored yellow.

Inputs and Status

Inputs color legend	Required Input
	Optional Input
Status and error messages	OK. Default values will be applied to blank model year and HP

A1. Inventory Calendar year

Inventory Calendar Year	2019
-------------------------	------

A2. Main Engine Inputs

Required Inputs			Optional Inputs			
Vessel Name	Vessel Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)	Vessel Number	Home Port
Flat-Deck Barge	Barge	1	2009			
Derrick Barge	Barge	1	2009			

A4. Project Information

Inputs	
Date (mm/dd/yyyy):	1/1/2019
Project Name:	Barge
Project Location:	Long Beach
Contact Person:	
Company Name:	
Mailing Address:	
Phone Number:	
Email Address:	

A3. Auxiliary Engine Inputs

Required Inputs			Optional Inputs	
Vessel Name	Auxiliary Engine Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)
Derrick Barge	Barge/Dredge Generator	1	2009	
Derrick Barge	Crane	1	2009	

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Main Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 2

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdIYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Flat-Deck Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Derrick Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1

East San Pedro Bay Ecosystem Restoration Study
 Alternative 2

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NO _x	ROG	CO	PM ₁₀	PM _{2.5}	NO _x	ROG	CO
1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25
1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 2

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NO _x	PM	ROG	MY Bin
159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 2

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdIYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Derrick Barge	Barge/Dredge Generator	Aux	C2	2009	2009	410	7	4	0.75	185.97	1
Derrick Barge	Crane	Aux	C2	2009	2009	349	7	4	0.42	185.97	1

East San Pedro Bay Ecosystem Restoration Study
 Alternative 2

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NO _x	ROG	CO	PM ₁₀	PM _{2.5}	NO _x	ROG	CO
360	10	23	0.110	0.101	4.000	0.121	0.920	0.67	0.62	0.21	0.44	0.25
360	10	9	0.110	0.101	4.000	0.121	0.920	0.67	0.62	0.21	0.44	0.25

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.114	0.103	4.146	0.104	1.022	0.006	596.868	0.024	0.005
0.147	0.131	4.588	0.125	1.150	0.006	596.868	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 2

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NO _x	PM	ROG	MY Bin
34.9	31.6	1,268.3	31.9	312.7	1.7	182,597.6	7.4	1.5	0.9	0.8	0.7	1996
21.6	19.2	673.4	18.4	168.8	0.8	87,605.0	3.6	0.7	0.9	0.8	0.7	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Main Engine Emission Rates

Calendar Year: 2019 Number of Entries: 2

Vessel/Engine Information							
Vessel Name	Vessel Number	Home Port	Vessel Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of engines
Flat-Deck Barge			Barge	2009	2883	0.45	1
Derrick Barge			Barge	2009	2883	0.45	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column J for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Auxiliary Engine Emission Rates

Calendar Year: 2019 Number of Entries: 2

Vessel/Engine Information								
Vessel Name	Vessel Number	Home Port	Vessel Type	Auxiliary Engine Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of Engines
Derrick Barge			Barge	Barge/Dredge Generator	2009	410	0.75	1
Derrick Barge			Barge	Crane	2009	349	0.42	1

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column K for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
0.048	0.042	1.485	0.041	0.372	0.002	193.136	0.008	0.002	193.799

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
0.15	0.13	4.59	0.13	1.15	0.006	596.87	0.02	0.00	598.9

Sand Dredging Emission Calculations

EQUIPMENT LIST & EMISSION FACTORS

Equipment	Units	Engine Count	Engine (kW)	Engine (Hp)	Load Factor	Hours per Day	HP-HR per Day w/ LF	Kw-HR per Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Rubber Tired Dozer	1	1		480	0.4				0.043	0.043	2.58	0.01014	3.46176	0.60455	540.32537	0.03069	0.01376	1,2
Excavator	1	1		211	0.38				0.043	0.043	2.58	0.01	3.46176	0.25122	532.94436	0.03027	0.01357	1,2
Forklift	1	1		200	0.2				0.043	0.043	2.58	0.01002	3.46176	0.49145	533.68728	0.03032	0.01359	1,2
Tug Boat Propulsion	1	1	223		0.31				0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03	3
Tug Boat Auxiliary	1	1	34		0.43				0.3	0.27	6.27	0.01	5	0.35	652	0.01	0.03	
Crew Boat Propulsion	1	1	370		0.38				0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03	4
Crew Boat Auxiliary	1	1	55		0.2				0.3	0.27	7.13	0.01	5	0.35	652	0.01	0.03	
Non-propelled cutterhead dredge T4 Engine	1	1	600		0.5				0.04	0.0356	1.8	0.00552	5	0.2	652	0.0038	0.031	7,8,9
DAILY EMISSIONS (LBS/DAY)																		
Equipment	Units	Engine Count	(kW)	(Hp)	Factor	Day	Day w/ LF	Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Rubber Tired Dozer	1	1		480	0.4	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Excavator	1	1		211	0.38	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Forklift	1	1		200	0.2	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Tug Boat Propulsion	1	1	223		0.31	20		1382.6	1.648	1.465	51.886	0.031	34.794	4.181	1989.967	0.092	0.092	5
Tug Boat Auxiliary	1	1	34		0.43	20		292.4	0.194	0.174	4.047	0.006	3.227	0.226	420.849	0.006	0.019	5
Crew Boat Propulsion	1	1	216		0.38	2		164.16	0.196	0.174	6.161	0.004	4.131	0.496	236.274	0.011	0.011	5
Crew Boat Auxiliary	1	1	34		0.32	2		21.76	0.014	0.013	0.342	0.000	0.240	0.017	31.319	0.000	0.001	5
Non-propelled cutterhead dredge T4 Engine	1	1	600		0.5	22		6600	0.583	0.519	26.225	0.080	72.848	2.914	9499.338	0.055	0.452	5
Daily Emissions w/ electric dredge (lbs/day)									2.052	1.826	62.436	0.041	42.393	4.921	2678.410	0.109	0.123	10
Daily Emissions w/ Tier 4 cutterhead dredge (lbs/day)									4.687	2.345	88.661	0.122	115.240	7.834	12177.748	0.165	0.575	

ANNUAL EMISSIONS (TONS/YEAR)																		
Equipment	Days/Year	Engine Count	(kW)	(Hp)	Factor	Day	Day w/ LF	Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Rubber Tired Dozer	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Excavator	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Forklift	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Tug Boat Propulsion	25								0.019	0.017	0.589	0.000	0.395	0.047	22.572	2.289	0.001	
Tug Boat Auxiliary	25								0.002	0.002	0.046	0.000	0.037	0.003	4.774	0.161	0.000	
Crew Boat Propulsion	25								0.002	0.002	0.070	0.000	0.047	0.006	2.680	0.272	0.000	
Crew Boat Auxiliary	25								0.000	0.000	0.004	0.000	0.003	0.000	0.355	0.012	0.000	
Non-propelled cutterhead dredge T4 engine	25								0.007	0.006	0.000	0.000	0.826	0.000	0.000	0.000	0.005	
Annual Emissions w/ electric dredge (ton/year)									0.023	0.021	0.708	0.000	0.481	0.056	30.381	2.734	0.001	10
Annual Emissions w/ Tier 4 cutterhead dredge (tons/year)									0.030	0.027	0.708	0.000	1.307	0.056	30.381	2.734	0.007	
Applicable General Conformity Rates (tons/year)									100	100	100	100	100	100	na	na	na	

Tons CO2E	Pounds CO2E	MT CO2E
99.15	198,307.56	89.98
100.68	201,361.99	91.36

- Offroad2011 categories are from EMFAC2011 Offroad Construction Equipment and Industrial Equipment module
- HP and load factors for offroad equipment are from CalEEMod, Appendix D, Table 3.3.
- per past plans and specs tug boat is approximately 300 HP; 1 kW = 1.34 HP; thus 223 kW
- crew boat HP approximately 290 HP ~ 216 kW per Port of LA Emissions Inventory
- conversion factor pounds-grams: 453 grams/lb.
- 1 metric ton = 2204 lbs
- non-propelled cutterhead dredge
- Range from 200 kW for small dredges to 30,000 kW for large dredges. EPA Tier 4 emission standards for marine diesel engines start at 600 kW. Thus, emission factors for 600 kW engines are used.
- Tier 4 emission factors 40CFR Part 1042.101
- Electric dredge emissions only include emissions from supporting marine and off-road equipmentsince there are no on-site emissions from electric dredges.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Alternative 2 - 3M Quarry														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.30	1.55	3.18	0.11	0.11	0.00	0.10	0.10	0.00	0.01	607.24	0.20	0.01	613.78
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.30	1.55	3.18	0.11	0.11	0.00	0.10	0.10	0.00	0.01	607.24	0.20	0.01	613.78
Total (tons/construction project)	0.35	1.82	3.73	0.12	0.12	0.00	0.11	0.11	0.00	0.01	710.48	0.23	0.01	718.12

Notes: Project Start Year -> 2019
 Project Length (months) -> 90
 Total Project Area (acres) -> 0
 Maximum Area Disturbed/Day (acres) -> 0
 Water Truck Used? -> No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Alternative 2 - 3M Quarry														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.35	1.82	3.73	0.12	0.12	0.00	0.11	0.11	0.00	0.01	710.48	0.23	0.01	651.48
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.35	1.82	3.73	0.12	0.12	0.00	0.11	0.11	0.00	0.01	710.48	0.23	0.01	651.48
Total (tons/construction project)	0.35	1.82	3.73	0.12	0.12	0.00	0.11	0.11	0.00	0.01	710.48	0.23	0.01	651.48

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model
Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name: Alternative 2 - 3M Quarry

Construction Start Year: 2019

Project Type: 4

Project Construction Time: 90.00 months

Working Days per Month: 26.00 days (assume 22 if unknown)

Predominant Soil/Site Type: Enter 1, 2, or 3
(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)

Project Length: 0.00 miles


Total Project Area: 0.00 acres

Maximum Area Disturbed/Day: 0.00 acres

Water Trucks Used?: 2

Version 9.0.0

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.



1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway
2) Road Widening : Project to add a new lane to an existing roadway
3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane
4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction

1) Sand Gravel : Use for quaternary deposits (Delta/West County)
2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta)
3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation: [Yellow Box]

Off-road Equipment Emissions Mitigation: [Yellow Box]

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (<http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation>).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	90.00	9.00		1/1/2019
Grading/Excavation	0.00	36.00		7/1/2026
Drainage/Utilities/Sub-Grade	0.00	31.50		7/1/2026
Paving	0.00	13.50		7/1/2026
Totals (Months)		90		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing		110.00			0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.03	0.11	0.05	0.02	1,737.72	0.00	0.27	1,819.15
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing					0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.03	0.11	0.05	0.02	1,737.72	0.00	0.27	1,819.15
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions		User Override of Worker		Default Values		Calculated					
User Input		Commute Default Values				Daily Trips	Daily VMT				
Miles/ one-way trip											
One-way trips/day						0	0.00				
No. of employees: Grubbing/Land Clearing						0	0.00				
No. of employees: Grading/Excavation						0	0.00				
No. of employees: Drainage/Utilities/Sub-Grade						0	0.00				
No. of employees: Paving						0	0.00				
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.02	1.01	0.09	0.05	0.02	0.00	325.86	0.00	0.01	328.12
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		1.10	2.83	0.31	0.00	0.00	0.00	69.93	0.08	0.03	81.71
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions		User Override of		Program Estimate of		User Override of Truck		Default Values		Calculated		User Override of		Default Values		Calculated	
User Input		Default # Water Trucks		Number of Water Trucks		Round Trips/Vehicle/Day		Round Trips/Vehicle/Day		Trips/day		Miles/Round Trip		Miles/Round Trip		Daily VMT	
Grubbing/Land Clearing - Exhaust																	0.00
Grading/Excavation - Exhaust																	0.00
Drainage/Utilities/Subgrade																	0.00
Paving																	0.00
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.03	0.11	0.05	0.02	1,737.72	0.00	0.27	1,819.15						
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust		User Override of Max		Default		PM10		PM2.5	
		Acreage Disturbed/Day		Maximum Acreage/Day		pounds/day	tons/period	pounds/day	tons/period
Fugitive Dust - Grubbing/Land Clearing						0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation						0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade						0.00	0.00	0.00	0.00

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of												
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when 'Tier 4 Mitigation' Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Loaders	0.30	1.55	3.18	0.11	0.10	0.01	607.24	0.20	0.01	613.78
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab														
Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	pounds per day	0.30	1.55	3.18	0.11	0.10	0.01	607.24	0.20	0.01	613.78		
	Grubbing/Land Clearing	tons per phase	0.35	1.82	3.73	0.12	0.11	0.01	710.48	0.23	0.01	718.12		

Grading/Excavation		Default Number of Vehicles	Mitigation Option Override of	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option Override of Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment				If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab										
Number of Vehicles		Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Paving	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of												
Override of Default Number of Vehicles	Program-estimate				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>				0.35	1.82	3.73	0.12	0.11	0.01	710.48	0.23	0.01	718.12	

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

East San Pedro Bay Ecosystem Restoration Study
Alternative 2

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> Alternative 2 - 3M Quarry														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.47	7.94	32.39	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,605.83	0.07	1.14	34,946.79
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	1.47	7.94	32.39	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,605.83	0.07	1.14	34,946.79
Total (tons/construction project)	0.06	0.35	1.43	0.10	0.10	0.00	0.04	0.04	0.00	0.01	1,529.58	0.00	0.05	1,544.65

Notes:
 Project Start Year -> 2019
 Project Length (months) -> 3
 Total Project Area (acres) -> 0
 Maximum Area Disturbed/Day (acres) -> 0
 Water Truck Used? -> No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	181	0	9,955	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.


Total Emission Estimates by Phase for -> Alternative 2 - 3M Quarry														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.06	0.35	1.43	0.10	0.10	0.00	0.04	0.04	0.00	0.01	1,529.58	0.00	0.05	1,401.30
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.06	0.35	1.43	0.10	0.10	0.00	0.04	0.04	0.00	0.01	1,529.58	0.00	0.05	1,401.30
Total (tons/construction project)	0.06	0.35	1.43	0.10	0.10	0.00	0.04	0.04	0.00	0.01	1,529.58	0.00	0.05	1,401.30

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model Data Entry Worksheet		Version 8.1.0		
<p>Note: Required data input sections have a yellow background. Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background. The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types. Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.</p>		<p>To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.</p>		
				
Input Type				
Project Name	Alternative 2 - 3M Quarry			
Construction Start Year	2019	Enter a Year between 2014 and 2025 (inclusive)		
Project Type	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction		
Project Construction Time	3.40	months		
Working Days per Month	26.00	days (assume 22 if unknown)		
Predominant Soil/Site Type: Enter 1, 2, or 3 <small>(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)</small>	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)		
Project Length	0.00	miles		
Total Project Area	0.00	acres		
Maximum Area Disturbed/Day	0.00	acres		
Water Trucks Used?	2	1. Yes 2. No		
Material Hauling Quantity Input				
Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing	1.00	181.00	0.00
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Mitigation Options				
On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer		
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard		

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	3.40	0.34		1/1/2019
Grading/Excavation	0.00	1.36		4/15/2019
Drainage/Utilities/Sub-Grade	0.00	1.19		4/15/2019
Paving	0.00	0.51		4/15/2019
Totals (Months)		3		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input										
Miles/round trip: Grubbing/Land Clearing	55.00			181	9955.00					
Miles/round trip: Grading/Excavation				0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00					
Miles/round trip: Paving				0	0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.48	0.10	0.04	0.02	1,576.79	0.00	0.05	1,592.32
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	1.47	7.94	32.39	2.26	0.88	0.33	34,605.83	0.07	1.14	34,946.79
Tons per const. Period - Grubbing/Land Clearing	0.06	0.35	1.43	0.10	0.04	0.01	1,529.58	0.00	0.05	1,544.65
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.06	0.35	1.43	0.10	0.04	0.01	1,529.58	0.00	0.05	1,544.65

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input										
Miles/round trip: Grubbing/Land Clearing				0	0.00					
Miles/round trip: Grading/Excavation				0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00					
Miles/round trip: Paving				0	0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.48	0.10	0.04	0.02	1,576.79	0.00	0.05	1,592.32
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions		User Override of Worker Commute Default Values		Default Values		Calculated Daily Trips	Calculated Daily VMT				
User Input											
Miles/ one-way trip											
One-way trips/day											
No. of employees: Grubbing/Land Clearing						0	0.00				
No. of employees: Grading/Excavation						0	0.00				
No. of employees: Drainage/Utilities/Sub-Grade						0	0.00				
No. of employees: Paving						0	0.00				
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.02	1.19	0.13	0.05	0.02	0.00	381.71	0.01	0.01	383.53	
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grubbing/Land Clearing (grams/trip)	1.08	2.86	0.23	0.00	0.00	0.00	85.97	0.01	0.01	89.17	
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions		User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT					
User Input											
Grubbing/Land Clearing - Exhaust						0.00					
Grading/Excavation - Exhaust						0.00					
Drainage/Utilities/Subgrade						0.00					
Paving						0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.48	0.10	0.04	0.02	1,576.79	0.00	0.05	1,592.32	
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.00	0.00	0.00	0.00

Values in cells D183 through D216, D234 through D267, D285 through D318, and D336 through D369 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)												
Override of Default Number of Vehicles	Program-estimate		Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing		pounds per day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing		tons per phase		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)			Equipment Tier	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
Override of Default Number of Vehicles	Program-estimate		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	tons per phase		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)												
Override of Default Number of Vehicles	Program-estimate				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					<i>If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab</i>									
Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total Emissions all Phases (tons per construction period) =>					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F424.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Alternative 2 - Worker Commute														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.06	1.53	0.13	0.07	0.07	0.00	0.03	0.03	0.00	0.00	462.25	0.01	0.01	465.85
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.06	1.53	0.13	0.07	0.07	0.00	0.03	0.03	0.00	0.00	462.25	0.01	0.01	465.85
Total (tons/construction project)	0.08	1.78	0.15	0.08	0.08	0.00	0.03	0.03	0.00	0.01	540.83	0.01	0.01	545.04

Notes:		Project Start Year ->	2019
		Project Length (months) ->	90
		Total Project Area (acres) ->	0
		Maximum Area Disturbed/Day (acres) ->	0
		Water Truck Used? ->	No
		Total Material Imported/Exported Volume (yd ³ /day)	
		Daily VMT (miles/day)	
Phase	Soil	Asphalt	Soil Hauling Asphalt Hauling Worker Commute Water Truck
Grubbing/Land Clearing	0	0	0 0 640 0
Grading/Excavation	0	0	0 0 0 0
Drainage/Utilities/Sub-Grade	0	0	0 0 0 0
Paving	0	0	0 0 0 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Alternative 2 - Worker Commute														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.08	1.78	0.15	0.08	0.08	0.00	0.03	0.03	0.00	0.01	540.83	0.01	0.01	494.46
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.08	1.78	0.15	0.08	0.08	0.00	0.03	0.03	0.00	0.01	540.83	0.01	0.01	494.46
Total (tons/construction project)	0.08	1.78	0.15	0.08	0.08	0.00	0.03	0.03	0.00	0.01	540.83	0.01	0.01	494.46

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model
Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name: Alternative 2 - Worker Commute

Construction Start Year: 2019

Project Type: 4

Project Construction Time: 90.00 months

Working Days per Month: 26.00 days (assume 22 if unknown)

Predominant Soil/Site Type: Enter 1, 2, or 3
(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)

Project Length: 0.00 miles


Total Project Area: 0.00 acres

Maximum Area Disturbed/Day: 0.00 acres

Water Trucks Used?: 2

Version 9.0.0

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.



Enter a Year between 2014 and 2040 (inclusive)

1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway
2) Road Widening : Project to add a new lane to an existing roadway
3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane
4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction

1) Sand Gravel : Use for quaternary deposits (Delta/West County)
2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta)
3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation: [Yellow Box]

Off-road Equipment Emissions Mitigation: [Yellow Box]

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (<http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation>).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	90.00	9.00		1/1/2019
Grading/Excavation	0.00	36.00		7/1/2026
Drainage/Utilities/Sub-Grade	0.00	31.50		7/1/2026
Paving	0.00	13.50		7/1/2026
Totals (Months)		90		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing		110.00			0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.03	0.11	0.05	0.02	1,737.72	0.00	0.27	1,819.15
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing					0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.03	0.11	0.05	0.02	1,737.72	0.00	0.27	1,819.15
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions		User Override of Worker Commute Default Values		Default Values		Calculated						
User Input		Commute Default Values		Daily Trips		Daily VMT						
Miles/ one-way trip		40										
One-way trips/day		2										
No. of employees: Grubbing/Land Clearing		8		16		640.00						
No. of employees: Grading/Excavation				0		0.00						
No. of employees: Drainage/Utilities/Sub-Grade				0		0.00						
No. of employees: Paving				0		0.00						
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)		0.02	1.01	0.09	0.05	0.02	0.00	325.86	0.00	0.01	328.12	
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grubbing/Land Clearing (grams/trip)		1.10	2.83	0.31	0.00	0.00	0.00	69.93	0.08	0.03	81.71	
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing		0.06	1.53	0.13	0.07	0.03	0.00	462.25	0.01	0.01	465.85	
Tons per const. Period - Grubbing/Land Clearing		0.08	1.78	0.15	0.08	0.03	0.01	540.83	0.01	0.01	545.04	
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project		0.08	1.78	0.15	0.08	0.03	0.01	540.83	0.01	0.01	545.04	

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions		User Override of Program Estimate of		User Override of Truck		Default Values		Calculated		User Override of		Default Values		Calculated			
User Input		Default # Water Trucks		Number of Water Trucks		Round Trips/Vehicle/Day		Round Trips/Vehicle/Day		Trips/day		Miles/Round Trip		Miles/Round Trip		Daily VMT	
Grubbing/Land Clearing - Exhaust																	0.00
Grading/Excavation - Exhaust																	0.00
Drainage/Utilities/Subgrade																	0.00
Paving																	0.00
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.03	0.11	0.05	0.02	1,737.72	0.00	0.27	1,819.15						
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust		User Override of Max		Default		PM10		PM2.5	
		Acreage Disturbed/Day		Maximum Acreage/Day		pounds/day		tons/per period	
Fugitive Dust - Grubbing/Land Clearing						0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation						0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade						0.00	0.00	0.00	0.00

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default		Mitigation Option		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of	Default											
Override of Default Number of Vehicles		Default Equipment Tier (applicable only when 'Tier 4 Mitigation' Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab														
Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Grubbing/Land Clearing		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Grubbing/Land Clearing		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Grading/Excavation		Default Number of Vehicles	Mitigation Option Override of	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
			Model Default Tier	Aerial Lifts		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Air Compressors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Bore/Drill Rigs		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Cement and Mortar Mixers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Concrete/Industrial Saws		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Cranes		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Crawler Tractors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Crushing/Proc. Equipment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Excavators		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Forklifts		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Generator Sets		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Graders		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Off-Highway Tractors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Off-Highway Trucks		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other Construction Equipment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other General Industrial Equipm		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Other Material Handling Equipm		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pavers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Paving Equipment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Plate Compactors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pressure Washers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Pumps		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rollers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rough Terrain Forklifts		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rubber Tired Dozers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Rubber Tired Loaders		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Scrapers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Signal Boards		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Skid Steer Loaders		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Surfacing Equipment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Sweepers/Scrubbers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Tractors/Loaders/Backhoes		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Trenchers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
			Model Default Tier	Welders		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			tons per phase		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option Override of Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment				If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab										
Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Paving	Default		Mitigation Option		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of	Default	Equipment Tier										
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		Equipment Tier	Type	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving		pounds per day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving		tons per phase		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Input Data Page

INSTRUCTIONS:
 1. Enter inputs into tables A1, A2, A3, and A4 below. Required inputs must be entered to estimate emission rates, optional inputs should be entered if available.
 2. After entering inputs, review status and error messages (cell E14); make changes as necessary until this cell is green indicating that inputs are ready.
 3. Results may be reviewed in "MainEngineEmissRates" and "AuxEngineEmissRates" tabs, both colored yellow.

Inputs and Status

Inputs color legend	Required Input
	Optional Input
Status and error messages	OK. Default values will be applied to blank model year and HP

A1. Inventory Calendar year

Inventory Calendar Year	2019
-------------------------	------

A2. Main Engine Inputs

Required Inputs			Optional Inputs			
Vessel Name	Vessel Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)	Vessel Number	Home Port
Tug Boat 1	Tow Boats / Push Boats	1	2009			

A4. Project Information

Inputs	
Date (mm/dd/yyyy):	1/1/2019
Project Name:	Barge Hauling
Project Location:	Long Beach
Contact Person:	
Company Name:	
Mailing Address:	
Phone Number:	
Email Address:	

A3. Auxiliary Engine Inputs

Required Inputs			Optional Inputs	
Vessel Name	Auxiliary Engine Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)
Tug Boat 1	Tow Boats / Push Boats Genera	1	2009	

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Main Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Tug Boat 1	Tow Boats / Push Boats	Main	A1	2009	2009	331	5	4	0.68	184.16	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
1,250	10	26	0.150	0.138	5.102	0.680	3.730	0.67	0.62	0.21	0.44	0.25

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 4A

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
34.0	30.7	1,175.9	128.8	919.8	1.2	132,965.3	5.4	1.1	0.95	0.80	0.72	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Tug Boat 1	Tow Boats / Push Boats	Aux	A2	2009	2009	79	2	2	0.43	184.16	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
1,633	10	25	0.220	0.202	5.320	1.178	3.730	0.44	0.40	0.14	0.28	0.16

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.207	0.188	5.326	0.943	3.969	0.006	591.045	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
7.0	6.4	180.7	32.0	134.6	0.2	20,049.5	0.8	0.2	0.9	0.8	0.7	1998

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Main Engine Emission Rates

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information							
Vessel Name	Vessel Number	Home Port	Vessel Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of engines
Tug Boat 1			Tow Boats / Push Boats	2009	331	0.68	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column J for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.075	0.068	2.592	0.284	2.028	0.003	293.139	0.012	0.002	294.145

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005	593.1

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Auxiliary Engine Emission Rates

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information								
Vessel Name	Vessel Number	Home Port	Vessel Type	Auxiliary Engine Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of Engines
Tug Boat 1			Tow Boats / Push Boats	Tow Boats / Push Boats Generator	2009	79	0.43	1

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column K for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.015	0.014	0.398	0.071	0.297	0.000	44.202	0.002	0.000	44.353

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.21	0.19	5.33	0.94	3.97	0.006	591.04	0.02	0.00	593.1

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Input Data Page

INSTRUCTIONS:
 1. Enter inputs into tables A1, A2, A3, and A4 below. Required inputs must be entered to estimate emission rates, optional inputs should be entered if available.
 2. After entering inputs, review status and error messages (cell E14); make changes as necessary until this cell is green indicating that inputs are ready.
 3. Results may be reviewed in "MainEngineEmissRates" and "AuxEngineEmissRates" tabs, both colored yellow.

Inputs and Status

Inputs color legend	Required Input
	Optional Input
Status and error messages	OK. Default values will be applied to blank model year and HP

A1. Inventory Calendar year

Inventory Calendar Year	2019
-------------------------	------

A2. Main Engine Inputs

Required Inputs			Optional Inputs			
Vessel Name	Vessel Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)	Vessel Number	Home Port
Barge	Barge	1	2009			
Derrick Barge	Barge	1	2009			

A4. Project Information

Inputs	
Date (mm/dd/yyyy):	1/1/2019
Project Name:	Barges
Project Location:	Long Beach
Contact Person:	
Company Name:	
Mailing Address:	
Phone Number:	
Email Address:	

A3. Auxiliary Engine Inputs

Required Inputs			Optional Inputs	
Vessel Name	Auxiliary Engine Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)
Barge	Barge/Dredge Generator	1	2009	
Derrick Barge	Barge/Dredge Generator	1	2009	

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Main Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 2

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdlYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Derrick Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25
1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 4A

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NO _x	PM	ROG	MY Bin
159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 2

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdlYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Barge	Barge/Dredge Generator	Aux	C2	2009	2009	410	7	4	0.75	185.97	1
Derrick Barge	Barge/Dredge Generator	Aux	C2	2009	2009	410	7	4	0.75	185.97	1

East San Pedro Bay Ecosystem Restoration Study
 Alternative 4A

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
360	10	23	0.110	0.101	4.000	0.121	0.920	0.67	0.62	0.21	0.44	0.25
360	10	23	0.110	0.101	4.000	0.121	0.920	0.67	0.62	0.21	0.44	0.25

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.114	0.103	4.146	0.104	1.022	0.006	596.868	0.024	0.005
0.114	0.103	4.146	0.104	1.022	0.006	596.868	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 4A

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NO _x	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NO _x	PM	ROG	MY Bin
34.9	31.6	1,268.3	31.9	312.7	1.7	182,597.6	7.4	1.5	0.9	0.8	0.7	1996
34.9	31.6	1,268.3	31.9	312.7	1.7	182,597.6	7.4	1.5	0.9	0.8	0.7	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Main Engine Emission Rates

Calendar Year: 2019 Number of Entries: 2

Vessel/Engine Information							
Vessel Name	Vessel Number	Home Port	Vessel Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of engines
Barge			Barge	2009	2883	0.45	1
Derrick Barge			Barge	2009	2883	0.45	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column J for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Auxiliary Engine Emission Rates

Calendar Year: 2019 Number of Entries: 2

Vessel/Engine Information								
Vessel Name	Vessel Number	Home Port	Vessel Type	Auxiliary Engine Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of Engines
Barge			Barge	Barge/Dredge Generator	2009	410	0.75	1
Derrick Barge			Barge	Barge/Dredge Generator	2009	410	0.75	1

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column K for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9

Sand Dredging Emission Calculations

EQUIPMENT LIST & EMISSION FACTORS

Equipment	Units	Engine Count	Engine (kW)	Engine (Hp)	Load Factor	Hours per Day	HP-HR per Day w/ LF	Kw-HR per Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes	
Rubber Tired Dozer	1	1		480	0.4				0.043	0.043	2.58	0.01014	3.46176	0.60455	540.32537	0.03069	0.01376	1,2	
Excavator	1	1		211	0.38				0.043	0.043	2.58	0.01	3.46176	0.25122	532.94436	0.03027	0.01357	1,2	
Forklift	1	1		200	0.2				0.043	0.043	2.58	0.01002	3.46176	0.49145	533.68728	0.03032	0.01359	1,2	
Tug Boat Propulsion	1	1	223		0.31				0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03	3	
Tug Boat Auxiliary	1	1	34		0.43				0.3	0.27	6.27	0.01	5	0.35	652	0.01	0.03		
Crew Boat Propulsion	1	1	370		0.38				0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03	4	
Crew Boat Auxiliary	1	1	55		0.2				0.3	0.27	7.13	0.01	5	0.35	652	0.01	0.03		
Non-propelled cutterhead dredge T4 Engine	1	1	600		0.5				0.04	0.0356	1.8	0.00552	5	0.2	652	0.0038	0.031	7,8,9	
DAILY EMISSIONS (LBS/DAY)																			
Equipment	Units	Engine Count	(kW)	(Hp)	Factor	Day	Day w/ LF	Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes	
Rubber Tired Dozer	1	1		480	0.4	0		0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Excavator	1	1		211	0.38	0		0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Forklift	1	1		200	0.2	0		0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Tug Boat Propulsion	1	1	223		0.31	20		1382.6	1.648	1.465	51.886	0.031	34.794	4.181	1989.967	0.092	0.092	5	
Tug Boat Auxiliary	1	1	34		0.43	20		292.4	0.194	0.174	4.047	0.006	3.227	0.226	420.849	0.006	0.019	5	
Crew Boat Propulsion	1	1	216		0.38	2		164.16	0.196	0.174	6.161	0.004	4.131	0.496	236.274	0.011	0.011	5	
Crew Boat Auxiliary	1	1	34		0.32	2		21.76	0.014	0.013	0.342	0.000	0.240	0.017	31.319	0.000	0.001	5	
Non-propelled cutterhead dredge T4 Engine	1	1	600		0.5	22		6600	0.583	0.519	26.225	0.080	72.848	2.914	9499.338	0.055	0.452	5	
Daily Emissions w/ electric dredge (lbs/day)									2.052	1.826	62.436	0.041	42.393	4.921	2678.410	0.109	0.123	10	
Daily Emissions w/ Tier 4 cutterhead dredge (lbs/day)									4.687	2.345	88.661	0.122	115.240	7.834	12177.748	0.165	0.575		

ANNUAL EMISSIONS (TONS/YEAR)																		
Equipment	Days/Year	Engine Count	(kW)	(Hp)	Factor	Day	Day w/ LF	Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Rubber Tired Dozer	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Excavator	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Forklift	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Tug Boat Propulsion	25								0.019	0.017	0.589	0.000	0.395	0.047	22.572	2.289	0.001	
Tug Boat Auxiliary	25								0.002	0.002	0.046	0.000	0.037	0.003	4.774	0.161	0.000	
Crew Boat Propulsion	25								0.002	0.002	0.070	0.000	0.047	0.006	2.680	0.272	0.000	
Crew Boat Auxiliary	25								0.000	0.000	0.004	0.000	0.003	0.000	0.355	0.012	0.000	
Non-propelled cutterhead dredge T4 engine	25								0.007	0.006	0.000	0.000	0.826	0.000	0.000	0.000	0.005	
Annual Emissions w/ electric dredge (ton/year)									0.023	0.021	0.708	0.000	0.481	0.056	30.381	2.734	0.001	10
Annual Emissions w/ Tier 4 cutterhead dredge (tons/year)									0.030	0.027	0.708	0.000	1.307	0.056	30.381	2.734	0.007	
Applicable General Conformity Rates (tons/year)									100	100	100	100	100	100	na	na	na	

Tons CO2E	Pounds CO2E	MT CO2E
99.15	198,307.56	89.98
100.68	201,361.99	91.36

- Offroad2011 categories are from EMFAC2011 Offroad Construction Equipment and Industrial Equipment module
- HP and load factors for offroad equipment are from CalEEMod, Appendix D, Table 3.3.
- per past plans and specs tug boat is approximately 300 HP; 1 kW = 1.34 HP; thus 223 kW
- crew boat HP approximately 290 HP ~ 216 kW per Port of LA Emissions Inventory
- conversion factor pounds-grams: 453 grams/lb.
- 1 metric ton = 2204 lbs
- non-propelled cutterhead dredge
- Range from 200 kW for small dredges to 30,000 kW for large dredges. EPA Tier 4 emission standards for marine diesel engines start at 600 kW. Thus, emission factors for 600 kW engines are used.
- Tier 4 emission factors 40CFR Part 1042.101
- Electric dredge emissions only include emissions from supporting marine and off-road equipmentsince there are no on-site emissions from electric dredges.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Alternative 4A - 3M Quarry														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.30	1.55	3.10	0.10	0.10	0.00	0.10	0.10	0.00	0.01	607.14	0.20	0.01	613.68
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.30	1.55	3.10	0.10	0.10	0.00	0.10	0.10	0.00	0.01	607.14	0.20	0.01	613.68
Total (tons/construction project)	0.37	1.93	3.87	0.13	0.13	0.00	0.12	0.12	0.00	0.01	757.71	0.24	0.01	765.87

Notes:		Project Start Year ->	2019
		Project Length (months) ->	96
		Total Project Area (acres) ->	0
		Maximum Area Disturbed/Day (acres) ->	0
		Water Truck Used? ->	No
		Total Material Imported/Exported Volume (yd ³ /day)	
		Daily VMT (miles/day)	
Phase	Soil	Asphalt	Soil Hauling Asphalt Hauling Worker Commute Water Truck
Grubbing/Land Clearing	0	0	0 0 0 0
Grading/Excavation	0	0	0 0 0 0
Drainage/Utilities/Sub-Grade	0	0	0 0 0 0
Paving	0	0	0 0 0 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Alternative 4A - 3M Quarry														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.37	1.93	3.87	0.13	0.13	0.00	0.12	0.12	0.00	0.01	757.71	0.24	0.01	694.80
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.37	1.93	3.87	0.13	0.13	0.00	0.12	0.12	0.00	0.01	757.71	0.24	0.01	694.80
Total (tons/construction project)	0.37	1.93	3.87	0.13	0.13	0.00	0.12	0.12	0.00	0.01	757.71	0.24	0.01	694.80

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.

**Road Construction Emissions Model
Data Entry Worksheet**

Version 9.0.0

Note: Required data input sections have a yellow background.
 Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
 The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
 Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name

Construction Start Year

Project Type

For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data

Project Construction Time

Working Days per Month

Predominant Soil/Site Type: Enter 1, 2, or 3
(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)

Project Length

Total Project Area

Maximum Area Disturbed/Day

Water Trucks Used?

Alternative 4A - 3M Quarry
2019
4
96.00
26.00
1
0.00
0.00
0.00
2

Enter a Year between 2014 and 2040 (inclusive)

- 1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway
- 2) Road Widening : Project to add a new lane to an existing roadway
- 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane
- 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction

months
days (assume 22 if unknown)

- 1) Sand Gravel : Use for quaternary deposits (Delta/West County)
- 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta)
- 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)

miles
acres
acres
1. Yes
2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	96.00	9.60		1/1/2019
Grading/Excavation	0.00	38.40		12/30/2026
Drainage/Utilities/Sub-Grade	0.00	33.60		12/30/2026
Paving	0.00	14.40		12/30/2026
Totals (Months)		96		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing		110.00			0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.04	0.11	0.05	0.02	1,732.39	0.00	0.27	1,813.58
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing					0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.04	0.11	0.05	0.02	1,732.39	0.00	0.27	1,813.58
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions		User Override of Worker		Default Values		Calculated					
User Input		Commute Default Values				Daily Trips	Daily VMT				
Miles/ one-way trip											
One-way trips/day						0	0.00				
No. of employees: Grubbing/Land Clearing						0	0.00				
No. of employees: Grading/Excavation						0	0.00				
No. of employees: Drainage/Utilities/Sub-Grade						0	0.00				
No. of employees: Paving						0	0.00				
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.02	0.99	0.08	0.05	0.02	0.00	323.36	0.00	0.01	325.58
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		1.09	2.81	0.31	0.00	0.00	0.00	69.41	0.07	0.03	81.05
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions		User Override of		Program Estimate of		User Override of Truck		Default Values		Calculated		User Override of		Default Values		Calculated	
User Input		Default # Water Trucks		Number of Water Trucks		Round Trips/Vehicle/Day		Round Trips/Vehicle/Day		Trips/day		Miles/Round Trip		Miles/Round Trip		Daily VMT	
Grubbing/Land Clearing - Exhaust																	0.00
Grading/Excavation - Exhaust																	0.00
Drainage/Utilities/Subgrade																	0.00
Paving																	0.00
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.04	0.11	0.05	0.02	1,732.39	0.00	0.27	1,813.58						
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust		User Override of Max		Default		PM10	PM10	PM2.5	PM2.5
		Acreage Disturbed/Day		Maximum Acreage/Day		pounds/day	tons/period	pounds/day	tons/period
Fugitive Dust - Grubbing/Land Clearing						0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation						0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade						0.00	0.00	0.00	0.00

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of												
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when 'Tier 4 Mitigation' Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Loaders	0.30	1.55	3.10	0.10	0.10	0.01	607.14	0.20	0.01	613.68
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab														
Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
pounds/day			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	pounds per day	0.30	1.55	3.10	0.10	0.10	0.01	607.14	0.20	0.01	613.68		
	Grubbing/Land Clearing	tons per phase	0.37	1.93	3.87	0.13	0.12	0.01	757.71	0.24	0.01	765.87		

Grading/Excavation		Default Number of Vehicles	Mitigation Option Override of	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option Override of Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment				If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab										
Number of Vehicles		Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Paving	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of												
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving				pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving				tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>					0.37	1.93	3.87	0.13	0.12	0.01	757.71	0.24	0.01	765.87

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

East San Pedro Bay Ecosystem Restoration Study
Alternative 4A

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> Alternative 4A - 3M Quarry														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.47	7.96	32.35	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,587.41	0.07	1.14	34,928.19
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	1.47	7.96	32.35	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,587.41	0.07	1.14	34,928.19
Total (tons/construction project)	0.27	1.46	5.94	0.41	0.41	0.00	0.16	0.16	0.00	0.06	6,353.36	0.01	0.21	6,415.96

Notes:
 Project Start Year -> 2019
 Project Length (months) -> 14
 Total Project Area (acres) -> 0
 Maximum Area Disturbed/Day (acres) -> 0
 Water Truck Used? -> No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	181	0	9,955	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.


Total Emission Estimates by Phase for -> Alternative 4A - 3M Quarry														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.27	1.46	5.94	0.41	0.41	0.00	0.16	0.16	0.00	0.06	6,353.36	0.01	0.21	5,820.52
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.27	1.46	5.94	0.41	0.41	0.00	0.16	0.16	0.00	0.06	6,353.36	0.01	0.21	5,820.52
Total (tons/construction project)	0.27	1.46	5.94	0.41	0.41	0.00	0.16	0.16	0.00	0.06	6,353.36	0.01	0.21	5,820.52

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model Data Entry Worksheet		Version 8.1.0		
<p>Note: Required data input sections have a yellow background. Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background. The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types. Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.</p>		<p>To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.</p>		
				
Input Type				
Project Name	Alternative 4A - 3M Quarry			
Construction Start Year	2019	Enter a Year between 2014 and 2025 (inclusive)		
Project Type	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction		
Project Construction Time	14.13	months		
Working Days per Month	26.00	days (assume 22 if unknown)		
Predominant Soil/Site Type: Enter 1, 2, or 3 <small>(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)</small>	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)		
Project Length	0.00	miles		
Total Project Area	0.00	acres		
Maximum Area Disturbed/Day	0.00	acres		
Water Trucks Used?	2	1. Yes 2. No		
Material Hauling Quantity Input				
Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing	1.00	181.00	0.00
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Mitigation Options				
On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer		
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard		

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	14.13	1.41		1/1/2019
Grading/Excavation	0.00	5.65		3/6/2020
Drainage/Utilities/Sub-Grade	0.00	4.95		3/6/2020
Paving	0.00	2.12		3/6/2020
Totals (Months)		14		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input										
Miles/round trip: Grubbing/Land Clearing	55.00			181	9955.00					
Miles/round trip: Grading/Excavation				0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00					
Miles/round trip: Paving				0	0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,575.95	0.00	0.05	1,591.48
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	1.47	7.96	32.35	2.26	0.88	0.33	34,587.41	0.07	1.14	34,928.19
Tons per const. Period - Grubbing/Land Clearing	0.27	1.46	5.94	0.41	0.16	0.06	6,353.36	0.01	0.21	6,415.96
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.27	1.46	5.94	0.41	0.16	0.06	6,353.36	0.01	0.21	6,415.96

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input										
Miles/round trip: Grubbing/Land Clearing				0	0.00					
Miles/round trip: Grading/Excavation				0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00					
Miles/round trip: Paving				0	0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,575.95	0.00	0.05	1,591.48
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions		User Override of Worker Commute Default Values		Default Values		Calculated Daily Trips	Calculated Daily VMT				
User Input											
Miles/ one-way trip											
One-way trips/day											
No. of employees: Grubbing/Land Clearing						0	0.00				
No. of employees: Grading/Excavation						0	0.00				
No. of employees: Drainage/Utilities/Sub-Grade						0	0.00				
No. of employees: Paving						0	0.00				
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.02	1.17	0.13	0.05	0.02	0.00	380.14	0.01	0.01	381.93	
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grubbing/Land Clearing (grams/trip)	1.06	2.81	0.22	0.00	0.00	0.00	85.67	0.01	0.01	88.82	
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions		User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT					
User Input											
Grubbing/Land Clearing - Exhaust						0.00					
Grading/Excavation - Exhaust						0.00					
Drainage/Utilities/Subgrade						0.00					
Paving						0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,575.95	0.00	0.05	1,591.48	
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.00	0.00	0.00	0.00

Values in cells D183 through D216, D234 through D267, D285 through D318, and D336 through D369 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Mitigation Option		Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of	Default											
	Override of Default Number of Vehicles	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier											
	<i>Program-estimate</i>				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab					pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Grading/Excavation		Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
Override of Default Number of Vehicles	Program-estimate														
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation		pounds per day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation		tons per phase		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Default Number of Vehicles		Mitigation Option		Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving	Default	Mitigation Option	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
					<i>If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab</i>									
	Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Paving		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Paving		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F424.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Alternative 4A - Worker Commute														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.06	1.50	0.13	0.07	0.07	0.00	0.03	0.03	0.00	0.00	458.70	0.01	0.01	462.23
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.06	1.50	0.13	0.07	0.07	0.00	0.03	0.03	0.00	0.00	458.70	0.01	0.01	462.23
Total (tons/construction project)	0.08	1.87	0.16	0.08	0.08	0.00	0.03	0.03	0.00	0.01	572.46	0.01	0.01	576.87

Notes:		Project Start Year ->	2019
		Project Length (months) ->	96
		Total Project Area (acres) ->	0
		Maximum Area Disturbed/Day (acres) ->	0
		Water Truck Used? ->	No
		Total Material Imported/Exported Volume (yd ³ /day)	
		Daily VMT (miles/day)	
Phase	Soil	Asphalt	
	Soil Hauling	Asphalt Hauling	Worker Commute
Grubbing/Land Clearing	0	0	640
Grading/Excavation	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0
Paving	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Alternative 4A - Worker Commute														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.08	1.87	0.16	0.08	0.08	0.00	0.03	0.03	0.00	0.01	572.46	0.01	0.01	523.33
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.08	1.87	0.16	0.08	0.08	0.00	0.03	0.03	0.00	0.01	572.46	0.01	0.01	523.33
Total (tons/construction project)	0.08	1.87	0.16	0.08	0.08	0.00	0.03	0.03	0.00	0.01	572.46	0.01	0.01	523.33


PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model
Data Entry Worksheet Version 9.0.0

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name	Alternative 4A - Worker Commute	
Construction Start Year	2019	Enter a Year between 2014 and 2040 (inclusive)
Project Type	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	96.00	months
Working Days per Month	26.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 <small>(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)</small>	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.00	miles
Total Project Area	0.00	acres
Maximum Area Disturbed/Day	0.00	acres
Water Trucks Used?	2	1. Yes 2. No



Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard
Off-road Equipment Emissions Mitigation		

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	96.00	9.60		1/1/2019
Grading/Excavation	0.00	38.40		12/30/2026
Drainage/Utilities/Sub-Grade	0.00	33.60		12/30/2026
Paving	0.00	14.40		12/30/2026
Totals (Months)		96		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing		110.00			0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.04	0.11	0.05	0.02	1,732.39	0.00	0.27	1,813.58
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing					0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.04	0.11	0.05	0.02	1,732.39	0.00	0.27	1,813.58
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions		User Override of Worker Commute Default Values		Default Values		Calculated						
User Input		Commute Default Values		Daily Trips		Daily VMT						
Miles/ one-way trip		40										
One-way trips/day		2										
No. of employees: Grubbing/Land Clearing		8		16		640.00						
No. of employees: Grading/Excavation				0		0.00						
No. of employees: Drainage/Utilities/Sub-Grade				0		0.00						
No. of employees: Paving				0		0.00						
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)		0.02	0.99	0.08	0.05	0.02	0.00	323.36	0.00	0.01	325.58	
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grubbing/Land Clearing (grams/trip)		1.09	2.81	0.31	0.00	0.00	0.00	69.41	0.07	0.03	81.05	
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing		0.06	1.50	0.13	0.07	0.03	0.00	458.70	0.01	0.01	462.23	
Tons per const. Period - Grubbing/Land Clearing		0.08	1.87	0.16	0.08	0.03	0.01	572.46	0.01	0.01	576.87	
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project		0.08	1.87	0.16	0.08	0.03	0.01	572.46	0.01	0.01	576.87	

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions		User Override of Program Estimate of		User Override of Truck		Default Values		Calculated		User Override of		Default Values		Calculated			
User Input		Default # Water Trucks		Number of Water Trucks		Round Trips/Vehicle/Day		Round Trips/Vehicle/Day		Trips/day		Miles/Round Trip		Miles/Round Trip		Daily VMT	
Grubbing/Land Clearing - Exhaust																	0.00
Grading/Excavation - Exhaust																	0.00
Drainage/Utilities/Subgrade																	0.00
Paving																	0.00
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Grubbing/Land Clearing (grams/mile)		0.04	0.42	3.04	0.11	0.05	0.02	1,732.39	0.00	0.27	1,813.58						
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust		User Override of Max		Default		PM10		PM2.5	
		Acreage Disturbed/Day		Maximum Acreage/Day		pounds/day		tons/per period	
Fugitive Dust - Grubbing/Land Clearing						0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation						0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade						0.00	0.00	0.00	0.00

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Override of	Mitigation Option	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when 'Tier 4 Mitigation' Option Selected)		Equipment Tier	Type									
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab														
Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Grading/Excavation		Default Number of Vehicles	Mitigation Option Override of	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option Override of Default	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles		Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment				If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab										
Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Paving	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of												
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving				pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving				tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Input Data Page

INSTRUCTIONS:
 1. Enter inputs into tables A1, A2, A3, and A4 below. Required inputs must be entered to estimate emission rates, optional inputs should be entered if available.
 2. After entering inputs, review status and error messages (cell E14); make changes as necessary until this cell is green indicating that inputs are ready.
 3. Results may be reviewed in "MainEngineEmissRates" and "AuxEngineEmissRates" tabs, both colored yellow.

Inputs and Status

Inputs color legend	Required Input
	Optional Input
Status and error messages	OK. Default values will be applied to blank model year and HP

A1. Inventory Calendar year

Inventory Calendar Year	2019
-------------------------	------

A2. Main Engine Inputs

Required Inputs			Optional Inputs			
Vessel Name	Vessel Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)	Vessel Number	Home Port
Tug Boat 1	Tow Boats / Push Boats	1	2009			

A4. Project Information

Inputs	
Date (mm/dd/yyyy):	1/1/2019
Project Name:	Barge Hauling
Project Location:	Long Beach
Contact Person:	
Company Name:	
Mailing Address:	
Phone Number:	
Email Address:	

A3. Auxiliary Engine Inputs

Required Inputs			Optional Inputs	
Vessel Name	Auxiliary Engine Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)
Tug Boat 1	Tow Boats / Push Boats Genera	1	2009	

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Main Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Tug Boat 1	Tow Boats / Push Boats	Main	A1	2009	2009	331	5	4	0.68	184.16	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
1,250	10	26	0.150	0.138	5.102	0.680	3.730	0.67	0.62	0.21	0.44	0.25

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 8

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
34.0	30.7	1,175.9	128.8	919.8	1.2	132,965.3	5.4	1.1	0.95	0.80	0.72	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Tug Boat 1	Tow Boats / Push Boats	Aux	A2	2009	2009	79	2	2	0.43	184.16	1

East San Pedro Bay Ecosystem Restoration Study
 Alternative 8

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
1,633	10	25	0.220	0.202	5.320	1.178	3.730	0.44	0.40	0.14	0.28	0.16

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.207	0.188	5.326	0.943	3.969	0.006	591.045	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 8

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
7.0	6.4	180.7	32.0	134.6	0.2	20,049.5	0.8	0.2	0.9	0.8	0.7	1998

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Main Engine Emission Rates

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information							
Vessel Name	Vessel Number	Home Port	Vessel Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of engines
Tug Boat 1			Tow Boats / Push Boats	2009	331	0.68	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column J for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.075	0.068	2.592	0.284	2.028	0.003	293.139	0.012	0.002	294.145

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.151	0.137	5.227	0.572	4.089	0.006	591.045	0.024	0.005	593.1

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Auxiliary Engine Emission Rates

Calendar Year: 2019 Number of Entries: 1

Vessel/Engine Information								
Vessel Name	Vessel Number	Home Port	Vessel Type	Auxiliary Engine Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of Engines
Tug Boat 1			Tow Boats / Push Boats	Tow Boats / Push Boats Generator	2009	79	0.43	1

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column K for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.015	0.014	0.398	0.071	0.297	0.000	44.202	0.002	0.000	44.353

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.21	0.19	5.33	0.94	3.97	0.006	591.04	0.02	0.00	593.1

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Input Data Page

INSTRUCTIONS:
 1. Enter inputs into tables A1, A2, A3, and A4 below. Required inputs must be entered to estimate emission rates, optional inputs should be entered if available.
 2. After entering inputs, review status and error messages (cell E14); make changes as necessary until this cell is green indicating that inputs are ready.
 3. Results may be reviewed in "MainEngineEmissRates" and "AuxEngineEmissRates" tabs, both colored yellow.

Inputs and Status

Inputs color legend	Required Input
	Optional Input
Status and error messages	OK. Default values will be applied to blank model year and HP

A1. Inventory Calendar year

Inventory Calendar Year	2019
-------------------------	------

A2. Main Engine Inputs

Required Inputs			Optional Inputs			
Vessel Name	Vessel Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)	Vessel Number	Home Port
Barge	Barge	1	2009			
Derrick Barge	Barge	1	2009			
Dredger	Dredge	1	2009			

A4. Project Information

Inputs	
Date (mm/dd/yyyy):	1/1/2019
Project Name:	Barges and Dredger
Project Location:	Long Beach
Contact Person:	
Company Name:	
Mailing Address:	
Phone Number:	
Email Address:	

A3. Auxiliary Engine Inputs

Required Inputs			Optional Inputs	
Vessel Name	Auxiliary Engine Type	No. of Engines	Engine Model Year	Engine Rated Power (hp)
Barge	Barge/Dredge Generator	1	2009	
Derrick Barge	Barge/Dredge Generator	1	2009	
Dredger	Dredger	1	2009	

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Main Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 3

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdIYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Derrick Barge	Barge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1
Dredger	Dredge	Main	C1	2009	2009	2,883	10	4	0.45	185.97	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25
1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25
1,776	10	17	0.110	0.101	4.290	0.145	0.920	0.67	0.62	0.21	0.44	0.25

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
 Alternative 8

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996
159.1	143.1	5,927.0	170.7	1,368.8	7.2	774,212.0	31.4	6.3	0.95	0.80	0.72	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Emission Factor Calculations

Auxiliary Engine Emission Factor Calculator

Calendar Year: 2019 Number of Entries: 3

Vessel/Engine Information											
Vessel Name	Vessel Type	Engine Type	Engine Category	Engine Model Year	MdYr Group	Engine HP	HP Category	FCF HP Category	Engine Load Factor	BSFC (g/hp-hr)	No. of engines
Barge	Barge/Dredge Generator	Aux	C2	2009	2009	410	7	4	0.75	185.97	1
Derrick Barge	Barge/Dredge Generator	Aux	C2	2009	2009	410	7	4	0.75	185.97	1
Dredger	Dredger	Aux	C2	2009	2009	425	7	4	0.51	185.97	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Activity			Zero-Hour Emission Factors (g/hp-hr)					Deterioration Factors (g/hp - hr)				
Annual Hours	Age	Useful Life	PM ₁₀	PM _{2.5}	NOx	ROG	CO	PM ₁₀	PM _{2.5}	NOx	ROG	CO
360	10	23	0.110	0.101	4.000	0.121	0.920	0.67	0.62	0.21	0.44	0.25
360	10	23	0.110	0.101	4.000	0.121	0.920	0.67	0.62	0.21	0.44	0.25
360	10	16	0.110	0.101	4.000	0.121	0.920	0.67	0.62	0.21	0.44	0.25

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Emission Rates (g/bhp-hr)								
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O
0.114	0.103	4.146	0.104	1.022	0.006	596.868	0.024	0.005
0.114	0.103	4.146	0.104	1.022	0.006	596.868	0.024	0.005
0.125	0.112	4.290	0.111	1.064	0.006	596.868	0.024	0.005

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Emission Rates (g/hr)									Fuel Correction Factor			
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	NOx	PM	ROG	MY Bin
34.9	31.6	1,268.3	31.9	312.7	1.7	182,597.6	7.4	1.5	0.9	0.8	0.7	1996
34.9	31.6	1,268.3	31.9	312.7	1.7	182,597.6	7.4	1.5	0.9	0.8	0.7	1996
27.1	24.3	929.8	24.1	230.6	1.2	129,371.1	5.2	1.0	0.9	0.8	0.7	1996

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Main Engine Emission Rates

Calendar Year: 2019 Number of Entries: 3

Vessel/Engine Information							
Vessel Name	Vessel Number	Home Port	Vessel Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of engines
Barge			Barge	2009	2883	0.45	1
Derrick Barge			Barge	2009	2883	0.45	1
Dredger			Dredge	2009	2883	0.45	1

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column J for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704
0.351	0.315	13.067	0.376	3.018	0.016	1706.847	0.069	0.014	1712.704

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9
0.123	0.110	4.569	0.132	1.055	0.006	596.868	0.024	0.005	598.9

SMAQMD Harborcraft, Dredge and Barge Emission Factor Calculator - Auxiliary Engine Emission Rates

Calendar Year: 2019 Number of Entries: 3

Vessel/Engine Information								
Vessel Name	Vessel Number	Home Port	Vessel Type	Auxiliary Engine Type	Engine Model Year	Engine Rated Power (hp)	Engine Load Factor	Number of Engines
Barge			Barge	Barge/Dredge Generator	2009	410	0.75	1
Derrick Barge			Barge	Barge/Dredge Generator	2009	410	0.75	1
Dredger			Dredge	Dredger	2009	425	0.51	1

Emission Rates (lb/hr; estimates for each row are totals over the number of engines listed in column K for that row)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
0.077	0.070	2.796	0.070	0.689	0.004	402.559	0.016	0.003	403.941
0.060	0.054	2.050	0.053	0.508	0.003	285.215	0.012	0.002	286.193

Emission Rates for a Single Engine (g/bhp-hr)									
PM ₁₀	PM _{2.5}	NOx	ROG	CO	SO ₂	CO ₂	CH ₄	N ₂ O	CO ₂ e
0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
0.11	0.10	4.15	0.10	1.02	0.006	596.87	0.02	0.00	598.9
0.12	0.11	4.29	0.11	1.06	0.006	596.87	0.02	0.00	598.9

Sand Dredging Emission Calculations

EQUIPMENT LIST & EMISSION FACTORS

Equipment	Units	Engine Count	Engine (kW)	Engine (Hp)	Load Factor	Hours per Day	HP-HR per Day w/ LF	Kw-HR per Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Rubber Tired Dozer	1	1		480	0.4				0.043	0.043	2.58	0.01014	3.46176	0.60455	540.32537	0.03069	0.01376	1,2
Excavator	1	1		211	0.38				0.043	0.043	2.58	0.01	3.46176	0.25122	532.94436	0.03027	0.01357	1,2
Forklift	1	1		200	0.2				0.043	0.043	2.58	0.01002	3.46176	0.49145	533.68728	0.03032	0.01359	1,2
Cement and Mortar Mixer	1	1		9	0.56				0.162	0.162	4.142	0.008	3.469	0.661	568.299	0.059	0.005	1,2
Tug Boat Propulsion	1	1	223		0.31				0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03	3
Tug Boat Auxiliary	1	1	34		0.43				0.3	0.27	6.27	0.01	5	0.35	652	0.01	0.03	
Crew Boat Propulsion	1	1	370		0.38				0.54	0.48	17	0.01	11.4	1.37	652	0.03	0.03	4
Crew Boat Auxiliary	1	1	55		0.2				0.3	0.27	7.13	0.01	5	0.35	652	0.01	0.03	
Non-propelled cutterhead dredge T4 Engine	1	1	600		0.5				0.04	0.0356	1.8	0.00552	5	0.2	652	0.0038	0.031	7,8,9
DAILY EMISSIONS (LBS/DAY)																		
Equipment	Units	Engine Count	(kW)	(Hp)	Factor	Day	Day w/ LF	Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Rubber Tired Dozer	1	1		480	0.4	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Excavator	1	1		211	0.38	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Forklift	1	1		200	0.2	0	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Cement and Mortar Mixer	1	1		9	0.56	22	0	110.88	0.040	0.040	1.014	0.002	0.849	0.162	139.102	0.014	0.001	5
Tug Boat Propulsion	1	1	223		0.31	20		1382.6	1.648	1.465	51.886	0.031	34.794	4.181	1989.967	0.092	0.092	5
Tug Boat Auxiliary	1	1	34		0.43	20		292.4	0.194	0.174	4.047	0.006	3.227	0.226	420.849	0.006	0.019	5
Crew Boat Propulsion	1	1	216		0.38	2		164.16	0.196	0.174	6.161	0.004	4.131	0.496	236.274	0.011	0.011	5
Crew Boat Auxiliary	1	1	34		0.32	2		21.76	0.014	0.013	0.342	0.000	0.240	0.017	31.319	0.000	0.001	5
Non-propelled cutterhead dredge T4 Engine	1	1	600		0.5	22		6600	0.583	0.519	26.225	0.080	72.848	2.914	9499.338	0.055	0.452	5
Daily Emissions w/ electric dredge (lbs/day)									2.092	1.866	63.450	0.043	43.242	5.082	2817.512	0.124	0.124	10
Daily Emissions w/ Tier 4 cutterhead dredge (lbs/day)									4.766	2.385	89.675	0.123	116.089	7.996	12316.850	0.179	0.576	

ANNUAL EMISSIONS (TONS/YEAR)																		
Equipment	Days/Year	Engine Count	(kW)	(Hp)	Factor	Day	Day w/ LF	Day w/ LF	PM10	PM2.5	NOX	SOX	CO	VOC	CO2	CH4	N2O	Notes
Rubber Tired Dozer	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Excavator	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Forklift	0								0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Cement and Mortar Mixer	313								0.006	0.006	0.144	0.000	0.121	0.023	19.754	0.002	0.000	
Tug Boat Propulsion	313								0.234	0.208	7.369	0.004	4.941	0.594	282.604	28.659	0.013	
Tug Boat Auxiliary	313								0.028	0.025	0.575	0.001	0.458	0.032	59.767	2.020	0.003	
Crew Boat Propulsion	313								0.028	0.025	0.875	0.001	0.587	0.071	33.554	3.403	0.002	
Crew Boat Auxiliary	313								0.002	0.002	0.049	0.000	0.034	0.002	4.448	0.150	0.000	
Non-propelled cutterhead dredge T4 engine	313								0.083	0.074	0.000	0.000	10.345	0.000	0.000	0.000	0.064	
Annual Emissions w/ electric dredge (ton/year)									0.297	0.265	9.011	0.006	6.141	0.722	400.128	34.235	0.018	10
Annual Emissions w/ Tier 4 cutterhead dredge (tons/year)									0.380	0.339	9.011	0.006	16.486	0.722	400.128	34.235	0.082	
Applicable General Conformity Rates (tons/year)									100	100	100	100	100	100	na	na	na	

	Annual Tons CO2E	Annual Pounds CO2E	Annual MT CO2E
	1,261.26	2,522,525.63	1,144.52
	1,280.38	2,560,767.07	1,161.87
Duration		947 Days	
Total:			3,515.31

- Offroad2011 categories are from EMFAC2011 Offroad Construction Equipment and Industrial Equipment module
- HP and load factors for offroad equipment are from CalEEMod, Appendix D, Table 3.3.
- per past plans and specs tug boat is approximately 300 HP; 1 kW = 1.34 HP; thus 223 kW
- crew boat HP approximately 290 HP ~ 216 kW per Port of LA Emissions Inventory
- conversion factor pounds-grams: 453 grams/lb.
- 1 metric ton = 2204 lbs
- non-propelled cutterhead dredge
- Range from 200 kW for small dredges to 30,000 kW for large dredges. EPA Tier 4 emission standards for marine diesel engines start at 600 kW. Thus, emission factors for 600 kW engines are used.
- Tier 4 emission factors 40CFR Part 1042.101
- Electric dredge emissions only include emissions from supporting marine and off-road equipmentsince there are no on-site emissions from electric dredges.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Alternative 8 - 3M Quarry														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.43	2.31	4.37	0.15	0.15	0.00	0.13	0.13	0.00	0.01	910.37	0.29	0.01	920.18
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.43	2.31	4.37	0.15	0.15	0.00	0.13	0.13	0.00	0.01	910.37	0.29	0.01	920.18
Total (tons/construction project)	0.63	3.39	6.42	0.21	0.21	0.00	0.20	0.20	0.00	0.01	1,337.34	0.43	0.01	1,351.74

Notes:		Project Start Year ->	2019
		Project Length (months) ->	113
		Total Project Area (acres) ->	0
		Maximum Area Disturbed/Day (acres) ->	0
		Water Truck Used? ->	No
		Total Material Imported/Exported Volume (yd ³ /day)	
		Daily VMT (miles/day)	
Phase	Soil	Asphalt	Soil Hauling Asphalt Hauling Worker Commute Water Truck
Grubbing/Land Clearing	0	0	0 0 0 0
Grading/Excavation	0	0	0 0 0 0
Drainage/Utilities/Sub-Grade	0	0	0 0 0 0
Paving	0	0	0 0 0 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Alternative 8 - 3M Quarry														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.63	3.39	6.42	0.21	0.21	0.00	0.20	0.20	0.00	0.01	1,337.34	0.43	0.01	1,226.29
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.63	3.39	6.42	0.21	0.21	0.00	0.20	0.20	0.00	0.01	1337.34	0.43	0.01	1,226.29
Total (tons/construction project)	0.63	3.39	6.42	0.21	0.21	0.00	0.20	0.20	0.00	0.01	1337.34	0.43	0.01	1,226.29


PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model
Data Entry Worksheet Version 9.0.0

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name	Alternative 8 - 3M Quarry	
Construction Start Year	2019	Enter a Year between 2014 and 2040 (inclusive)
Project Type	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	113.00	months
Working Days per Month	26.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 <small>(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)</small>	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.00	miles
Total Project Area	0.00	acres
Maximum Area Disturbed/Day	0.00	acres
Water Trucks Used?	2	1. Yes 2. No



Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard
Off-road Equipment Emissions Mitigation		

The remaining sections of this sheet contain areas that require modification when "Other Project Type" is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	113.00	11.30		1/1/2019
Grading/Excavation	0.00	45.20		5/31/2028
Drainage/Utilities/Sub-Grade	0.00	39.55		5/31/2028
Paving	0.00	16.95		5/31/2028
Totals (Months)		113		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT										
User Input																
Miles/round trip: Grubbing/Land Clearing		110.00			0	0.00										
Miles/round trip: Grading/Excavation					0	0.00										
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00										
Miles/round trip: Paving					0	0.00										
Emission Rates																
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Grubbing/Land Clearing (grams/mile)	0.03	0.42	3.05	0.11	0.05	0.02	1,715.91	0.00	0.27	1,796.33						
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Hauling Emissions							ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	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
Tons per const. Period - Grubbing/Land Clearing	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
Pounds per day - Grading/Excavation	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
Tons per const. Period - Grading/Excavation	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
Pounds per day - Drainage/Utilities/Sub-Grade	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
Tons per const. Period - Drainage/Utilities/Sub-Grade	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
Pounds per day - Paving	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
Tons per const. Period - Paving	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
Total tons per construction project	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

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT										
User Input																
Miles/round trip: Grubbing/Land Clearing					0	0.00										
Miles/round trip: Grading/Excavation					0	0.00										
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00										
Miles/round trip: Paving					0	0.00										
Emission Rates																
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e						
Grubbing/Land Clearing (grams/mile)	0.03	0.42	3.05	0.11	0.05	0.02	1,715.91	0.00	0.27	1,796.33						
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
Emissions							ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	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
Tons per const. Period - Grubbing/Land Clearing	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
Pounds per day - Grading/Excavation	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
Tons per const. Period - Grading/Excavation	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
Pounds per day - Drainage/Utilities/Sub-Grade	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
Tons per const. Period - Drainage/Utilities/Sub-Grade	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
Pounds per day - Paving	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
Tons per const. Period - Paving	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
Total tons per construction project	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

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions		User Override of Worker Commute Default Values		Default Values		Calculated					
User Input				Daily Trips	Daily VMT						
Miles/ one-way trip											
One-way trips/day				0	0.00						
No. of employees: Grubbing/Land Clearing				0	0.00						
No. of employees: Grading/Excavation				0	0.00						
No. of employees: Drainage/Utilities/Sub-Grade				0	0.00						
No. of employees: Paving				0	0.00						
Emission Rates											
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.02	0.94	0.08	0.05	0.02	0.00	315.96	0.00	0.01	318.06	
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grubbing/Land Clearing (grams/trip)	1.04	2.74	0.29	0.00	0.00	0.00	67.85	0.07	0.03	79.08	
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions											
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions		User Override of Program Estimate of		User Override of Truck		Default Values		Calculated			
User Input	Default # Water Trucks	Number of Water Trucks	Round Trips/Vehicle/Day	Round Trips/Vehicle/Day	Trips/day	Miles/Round Trip	Miles/Round Trip	Daily VMT			
Grubbing/Land Clearing - Exhaust								0.00			
Grading/Excavation - Exhaust								0.00			
Drainage/Utilities/Subgrade								0.00			
Paving								0.00			
Emission Rates											
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.03	0.42	3.05	0.11	0.05	0.02	1,715.91	0.00	0.27	1,796.33	
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions											
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust		User Override of Max Acreage Disturbed/Day		PM10	PM10	PM2.5	PM2.5
		Default	Maximum Acreage/Day	pounds/day	tons/period	pounds/day	tons/period
Fugitive Dust - Grubbing/Land Clearing				0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation				0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade				0.00	0.00	0.00	0.00

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Mitigation Option	Default	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of												
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when 'Tier 4 Mitigation' Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Rubber Tired Loaders	0.43	2.31	4.37	0.15	0.13	0.01	910.37	0.29	0.01	920.18
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab														
Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
pounds/day			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	pounds per day	0.43	2.31	4.37	0.15	0.13	0.01	910.37	0.29	0.01	920.18		
	Grubbing/Land Clearing	tons per phase	0.63	3.39	6.42	0.21	0.20	0.01	1,337.34	0.43	0.01	1,351.74		

Grading/Excavation		Default Number of Vehicles	Mitigation Option Override of	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade				Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Default	Mitigation Option	Default												
Number of Vehicles	Override of	Default		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier											
		Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment				If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab										
Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade	pounds per day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade	tons per phase		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Paving		Default Number of Vehicles	Mitigation Option Override of	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab									
	Number of Vehicles		Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving			pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving			tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>					0.63	3.39	6.42	0.21	0.20	0.01	1,337.34	0.43	0.01	1,351.74

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203	12.00	8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

East San Pedro Bay Ecosystem Restoration Study
Alternative 8

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> Alternative 8 - 3M Quarry														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.47	7.98	32.29	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,560.89	0.07	1.14	34,901.41
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	1.47	7.98	32.29	2.26	2.26	0.00	0.88	0.88	0.00	0.33	34,560.89	0.07	1.14	34,901.41
Total (tons/construction project)	0.36	1.98	8.02	0.56	0.56	0.00	0.22	0.22	0.00	0.08	8,581.47	0.02	0.28	8,666.02

Notes:
 Project Start Year -> 2019
 Project Length (months) -> 19
 Total Project Area (acres) -> 0
 Maximum Area Disturbed/Day (acres) -> 0
 Water Truck Used? -> No

Phase	Total Material Imported/Exported Volume (yd ³ /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	181	0	9,955	0	0	0
Grading/Excavation	0	0	0	0	0	0
Drainage/Utilities/Sub-Grade	0	0	0	0	0	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Alternative 8 - 3M Quarry														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.36	1.98	8.02	0.56	0.56	0.00	0.22	0.22	0.00	0.08	8,581.47	0.02	0.28	7,861.76
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.36	1.98	8.02	0.56	0.56	0.00	0.22	0.22	0.00	0.08	8,581.47	0.02	0.28	7,861.76
Total (tons/construction project)	0.36	1.98	8.02	0.56	0.56	0.00	0.22	0.22	0.00	0.08	8,581.47	0.02	0.28	7,861.76


PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model
Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Version 8.1.0

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.



Input Type

Project Name	Alternative 8 - 3M Quarry	
Construction Start Year	2019	Enter a Year between 2014 and 2025 (inclusive)
Project Type	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	19.10	months
Working Days per Month	26.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 <small>(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)</small>	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.00	miles
Total Project Area	0.00	acres
Maximum Area Disturbed/Day	0.00	acres
Water Trucks Used?	2	1. Yes 2. No

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing	1.00	181.00	0.00
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	
Off-road Equipment Emissions Mitigation	Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.
http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Truck Hauling_Alt8.xlsx
Data Entry
2

Data Entry Worksheet

2

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	19.10	1.91		1/1/2019
Grading/Excavation	0.00	7.64		8/4/2020
Drainage/Utilities/Sub-Grade	0.00	6.69		8/4/2020
Paving	0.00	2.87		8/4/2020
Totals (Months)		19		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input										
Miles/round trip: Grubbing/Land Clearing	55.00			181	9955.00					
Miles/round trip: Grading/Excavation				0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00					
Miles/round trip: Paving				0	0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,574.74	0.00	0.05	1,590.26
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	1.47	7.98	32.29	2.26	0.88	0.33	34,560.89	0.07	1.14	34,901.41
Tons per const. Period - Grubbing/Land Clearing	0.36	1.98	8.02	0.56	0.22	0.08	8,581.47	0.02	0.28	8,666.02
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.36	1.98	8.02	0.56	0.22	0.08	8,581.47	0.02	0.28	8,666.02

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input										
Miles/round trip: Grubbing/Land Clearing				0	0.00					
Miles/round trip: Grading/Excavation				0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00					
Miles/round trip: Paving				0	0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,574.74	0.00	0.05	1,590.26
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions		User Override of Worker Commute Default Values		Default Values		Calculated Daily Trips	Calculated Daily VMT				
User Input											
Miles/ one-way trip											
One-way trips/day											
No. of employees: Grubbing/Land Clearing						0	0.00				
No. of employees: Grading/Excavation						0	0.00				
No. of employees: Drainage/Utilities/Sub-Grade						0	0.00				
No. of employees: Paving						0	0.00				
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.02	1.15	0.12	0.05	0.02	0.00	377.88	0.01	0.01	379.63	
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grubbing/Land Clearing (grams/trip)	1.05	2.74	0.22	0.00	0.00	0.00	85.25	0.01	0.01	88.30	
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions		User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Vehicle/Day	Default Values Miles Traveled/Vehicle/Day	Calculated Daily VMT					
User Input											
Grubbing/Land Clearing - Exhaust						0.00					
Grading/Excavation - Exhaust						0.00					
Drainage/Utilities/Subgrade						0.00					
Paving						0.00					
Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Grubbing/Land Clearing (grams/mile)	0.07	0.36	1.47	0.10	0.04	0.02	1,574.74	0.00	0.05	1,590.26	
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade			0.00	0.00	0.00	0.00

Values in cells D183 through D216, D234 through D267, D285 through D318, and D336 through D369 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Mitigation Option		Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)											
Override of Default Number of Vehicles	Program-estimate				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab					pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
Number of Vehicles		Equipment Tier	Type											
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing		pounds per day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing		tons per phase		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation		Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
Override of Default Number of Vehicles	Program-estimate														
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Grading/Excavation		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Grading/Excavation		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab		Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles		Equipment Tier		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A			0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Drainage/Utilities/Sub-Grade		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Drainage/Utilities/Sub-Grade		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving	Default	Mitigation Option	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
					If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab									
	Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Paving		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Paving		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F424.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Alternative 8 - Worker Commute														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.06	1.43	0.12	0.07	0.07	0.00	0.03	0.03	0.00	0.00	448.20	0.01	0.01	451.55
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (pounds/day)	0.06	1.43	0.12	0.07	0.07	0.00	0.03	0.03	0.00	0.00	448.20	0.01	0.01	451.55
Total (tons/construction project)	0.09	2.10	0.17	0.10	0.10	0.00	0.04	0.04	0.00	0.01	658.41	0.01	0.02	663.33

Notes:		Project Start Year ->	2019
		Project Length (months) ->	113
		Total Project Area (acres) ->	0
		Maximum Area Disturbed/Day (acres) ->	0
		Water Truck Used? ->	No
		Total Material Imported/Exported Volume (yd ³ /day)	
		Daily VMT (miles/day)	
Phase	Soil	Asphalt	Soil Hauling Asphalt Hauling Worker Commute Water Truck
Grubbing/Land Clearing	0	0	0 0 640 0
Grading/Excavation	0	0	0 0 0 0
Drainage/Utilities/Sub-Grade	0	0	0 0 0 0
Paving	0	0	0 0 0 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Alternative 8 - Worker Commute														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.09	2.10	0.17	0.10	0.10	0.00	0.04	0.04	0.00	0.01	658.41	0.01	0.02	601.77
Grading/Excavation	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
Drainage/Utilities/Sub-Grade	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
Paving	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
Maximum (tons/phase)	0.09	2.10	0.17	0.10	0.10	0.00	0.04	0.04	0.00	0.01	658.41	0.01	0.02	601.77
Total (tons/construction project)	0.09	2.10	0.17	0.10	0.10	0.00	0.04	0.04	0.00	0.01	658.41	0.01	0.02	601.77

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.
 Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.
 CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.
 The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model
Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Input Type

Project Name: Alternative 8 - Worker Commute


Construction Start Year: 2019
Enter a Year between 2014 and 2040 (inclusive)

Project Type: 4
For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data

Project Construction Time: 113.00 months
Working Days per Month: 26.00 days (assume 22 if unknown)

Predominant Soil/Site Type: Enter 1, 2, or 3
(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)

Project Length: 0.00 miles
Total Project Area: 0.00 acres
Maximum Area Disturbed/Day: 0.00 acres
Water Trucks Used?: 2
1. Yes
2. No



To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation:

Off-road Equipment Emissions Mitigation:

Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (<http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation>).
Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	113.00	11.30		1/1/2019
Grading/Excavation	0.00	45.20		5/31/2028
Drainage/Utilities/Sub-Grade	0.00	39.55		5/31/2028
Paving	0.00	16.95		5/31/2028
Totals (Months)		113		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT				
User Input										
Miles/round trip: Grubbing/Land Clearing		110.00			0	0.00				
Miles/round trip: Grading/Excavation					0	0.00				
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00				
Miles/round trip: Paving					0	0.00				
Emission Rates										
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	0.42	3.05	0.11	0.05	0.02	1,715.91	0.00	0.27	1,796.33
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions										
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT				
User Input										
Miles/round trip: Grubbing/Land Clearing					0	0.00				
Miles/round trip: Grading/Excavation					0	0.00				
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00				
Miles/round trip: Paving					0	0.00				
Emission Rates										
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	0.42	3.05	0.11	0.05	0.02	1,715.91	0.00	0.27	1,796.33
Grading/Excavation (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions										
	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions		User Override of Worker Commute Default Values		Default Values		Calculated					
User Input				Daily Trips	Daily VMT						
Miles/ one-way trip	40										
One-way trips/day	2										
No. of employees: Grubbing/Land Clearing	8			16	640.00						
No. of employees: Grading/Excavation				0	0.00						
No. of employees: Drainage/Utilities/Sub-Grade				0	0.00						
No. of employees: Paving				0	0.00						
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.02	0.94	0.08	0.05	0.02	0.00	315.96	0.00	0.01	318.06
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		1.04	2.74	0.29	0.00	0.00	0.00	67.85	0.07	0.03	79.08
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.06	1.43	0.12	0.07	0.03	0.00	448.20	0.01	0.01	451.55
Tons per const. Period - Grubbing/Land Clearing		0.09	2.10	0.17	0.10	0.04	0.01	658.41	0.01	0.02	663.33
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.09	2.10	0.17	0.10	0.04	0.01	658.41	0.01	0.02	663.33

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions		User Override of Program Estimate of		User Override of Truck		Default Values		Calculated			
User Input	Default # Water Trucks	Number of Water Trucks	Round Trips/Vehicle/Day	Round Trips/Vehicle/Day	Trips/day	Miles/Round Trip	Miles/Round Trip	Daily VMT			
Grubbing/Land Clearing - Exhaust											0.00
Grading/Excavation - Exhaust											0.00
Drainage/Utilities/Subgrade											0.00
Paving											0.00
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.03	0.42	3.05	0.11	0.05	0.02	1,715.91	0.00	0.27	1,796.33
Grading/Excavation (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.00	0.00	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust		User Override of Max Acreage Disturbed/Day		PM10	PM10	PM2.5	PM2.5
		Default Maximum Acreage/Day		pounds/day	tons/period	pounds/day	tons/period
Fugitive Dust - Grubbing/Land Clearing				0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation				0.00	0.00	0.00	0.00
Fugitive Dust - Drainage/Utilities/Subgrade				0.00	0.00	0.00	0.00

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions														
Grubbing/Land Clearing	Default	Override of	Mitigation Option	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when 'Tier 4 Mitigation' Option Selected)		Equipment Tier	Type									
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment														
If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab														
Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Grading/Excavation		Default Number of Vehicles	Mitigation Option Override of	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation			tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option Override of Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment				If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab										
Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00		N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Drainage/Utilities/Sub-Grade		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Paving		Default Number of Vehicles	Mitigation Option Override of	Default	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier		Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment					If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab									
Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Paving	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Paving	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total Emissions all Phases (tons per construction period) =>			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET