APPENDIX A

Construction and Operation Information

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A.1 Construction Schedule

Construction Activity [1, 2]	Approximate Start Date (Month - Year)	Duration (months)	Assumptions
Mobilization [3]	Starts March 2013	8	Ends October 2013
Site Preparation	Starts April 2013	5	Ends August 2013
Demolition (bldg)	Apr-13	5	
Land Clearing [4]	Apr-13	5	Grubbing
Earth Moving [4]	Starts August 2013	25	Ends August 2015
Grading	Aug-13	6	Duration based on URBEMIS2007 default construction schedule.
Trenching	Feb-14	6	
Cut / Fill	Sep-13	24	
Roadway Crossings	Starts June 2013	55	Ends December 2017
Projects < 1 mile	Jan-17	12	Duration based on SAC Roadway Model default construction schedule.
Projects < 2.5 miles	Jan-15	24	
Projects > 2.5 miles	Jun-14	30	
Structures	Jun-13	12	
Elevated Structures	Starts June 2013	55	Ends December 2017
Construction [5]	Jul-13	54	
Concrete Batch Plant [6]	Jun-13	55	For Elevated Structures concrete.
Lay Track	Starts January 2014	44	Ends August 2017
At Grade: Lay Rail [7]	Jan-14	44	Shortened Final Quarter; all tracks laid simultaneously.
Elevated: Lay Rail [8]	Jan-14	44	
Retained Fill: Lay Rail [9]	Jan-14	44	
Concrete Batch Plant [6]	Jan-14	44	For Retained Fill concrete.
Systems: Traction Power Supply Station	Starts July 2016	29	Ends November 2018
Mass Site Grading	Jul-16	4	
Building Construction	Nov-11	21	2 buildings constructed.
Architectural Coating	Aug-18	4	
Systems: Switching Station	Starts July 2016	29	Ends November 2018
Mass Site Grading	Jul-16	6	
Building Construction	Jan-17	17	3 buildings constructed.
Architectural Coating	Jun-18	6	
Systems: Paralleling Station	Starts July 2016	29	Ends November 2018
Mass Site Grading	Jul-16	6	
Building Construction	Jan-17	17	4 buildings constructed.
Architectural Coating	Jun-18	6	
Demobilization [3]	Starts August 2017	29	Ends December 2019
HMF (Phase 1)	Starts August 2017	4	Ends November 2017
Mass Site Grading	Aug-17	4	
HMF (Phase 2)	Starts June 2018	7	Ends December 2018
Paving	Jun-18	1	
Building Construction	Jul-18	6	
At Grade: Lay Rail [7]	Jul-18	6	Q1 simultaneous with Q2; Q3 simultaneous with Q4
Elevated: Lay Rail [8]	Jul-18	6	
Retained Fill: Lay Rail [9]	Jul-18	6	
Elevated Structures Construction [6]	Jul-18	6	
Concrete Batch Plant [6]	Jul-18	6	For Elevated and Retained Fill concrete.
HMF (Phase 3)	Starts January 2021	7	Ends July 2021
Paving	Jan-21	1	
Building Construction	Feb-21	6	
Architectural Coating	Jul-21	1	
At Grade: Lay Rail [7]	Feb-21	6	Q1 simultaneous with Q2; Q3 simultaneous with Q4
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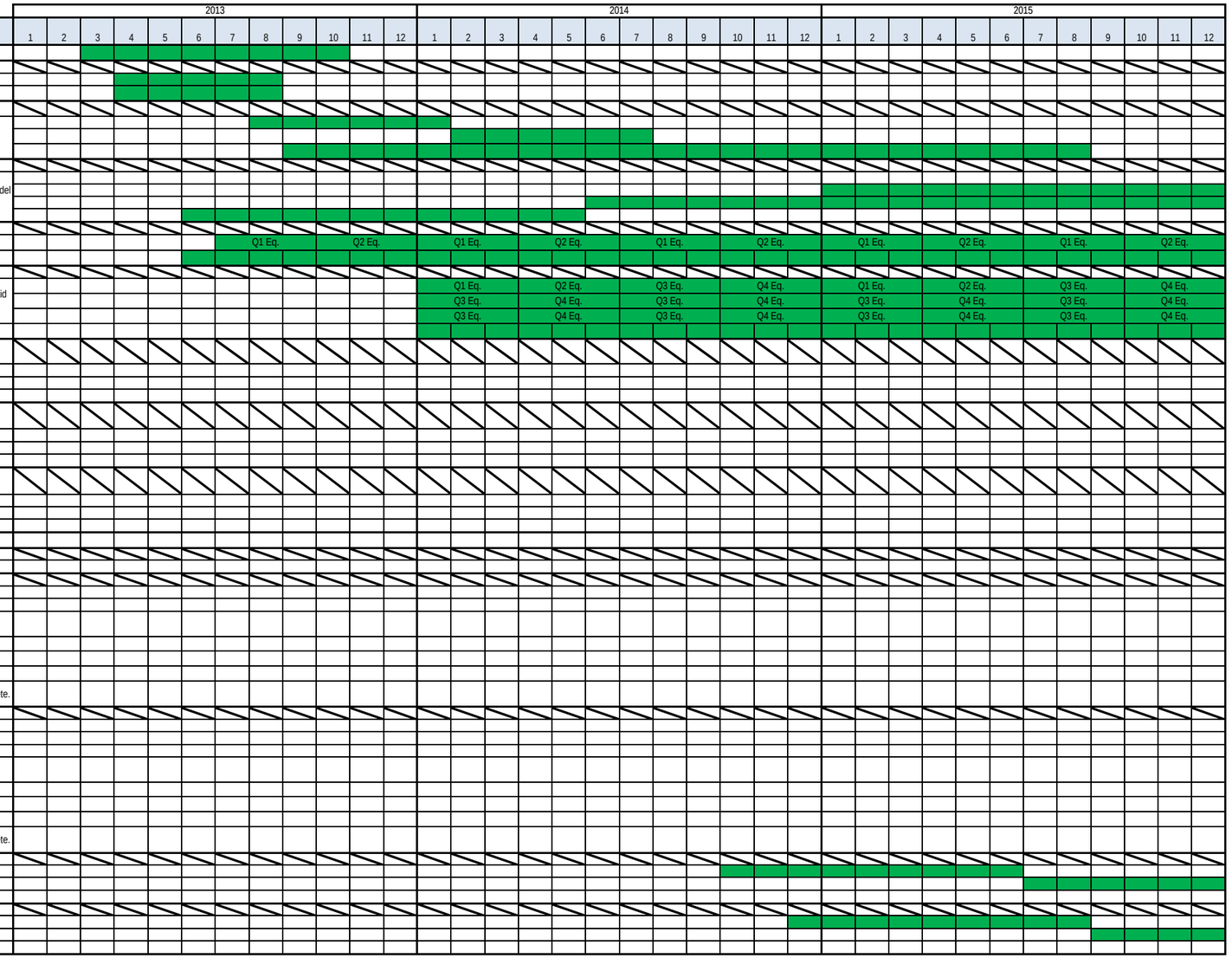
Retained Fill: Lay Rail [9]	Feb-21	6	
Elevated Structures Construction [6]	Feb-21	6	
Concrete Batch Plant [6]	Feb-21	6	For Elevated and Retained Fill concrete.
Merced Station Construction	Starts October 2014	59	Ends August 2019
Mass Site Grading	Oct-14	9	
Building Construction	Jul-15	44	
Architectural Coating	Mar-19	6	
Fresno Station Construction	Starts December 2014	59	Ends October 2019
Mass Site Grading	Dec-14	9	
Building Construction	Sep-15	44	
Architectural Coating	May-19	6	



Notes:

[1] Schedule provided by the Project Management Team (PMT); assumptions are documented in CV Construction Schedule FINAL - AQ Assumptions.docx.

[2] Material Hauling activities will coincide with construction of elevated structures or laying of rail.

[3] Mobilization and Demobilization phases assume 2 staging areas.

[4] The Land Clearing and Earth Moving activities are for the alignment right-of-way (ROW) and do not include the areas cleared for the HMF, Systems, and Stations.

[5] The Construction of Elevated Structures is characterized by 2 repeating quarters; each quarter utilizes a different set of equipment necessary for construction.

[6] Elevated Structures Construction and the Concrete Batch Plant are required wherever Elevated Rail is being laid Additionally, the Concrete Batch Plant is also necessary wherever Retained Fill Rail is being laid..

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[8] The Elevated: Lay Rail construction phase is characterized by 2 repeating quarters; each quarter utilizes a different set of equipment necessary to lay ballast and rail.

[9] The Retained Fill: Lay Rail construction phase is presumed to use the same equipment and duration as the Elevated: Lay Rail construction phase.

A.1 Construction Schedule

Construction Activity [1, 2]	Approximate Start Date (Month - Year)	Duration (months)	Assumptions	2016												2017												2018											
				1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mobilization [3]	Starts March 2013	8	Ends October 2013																																				
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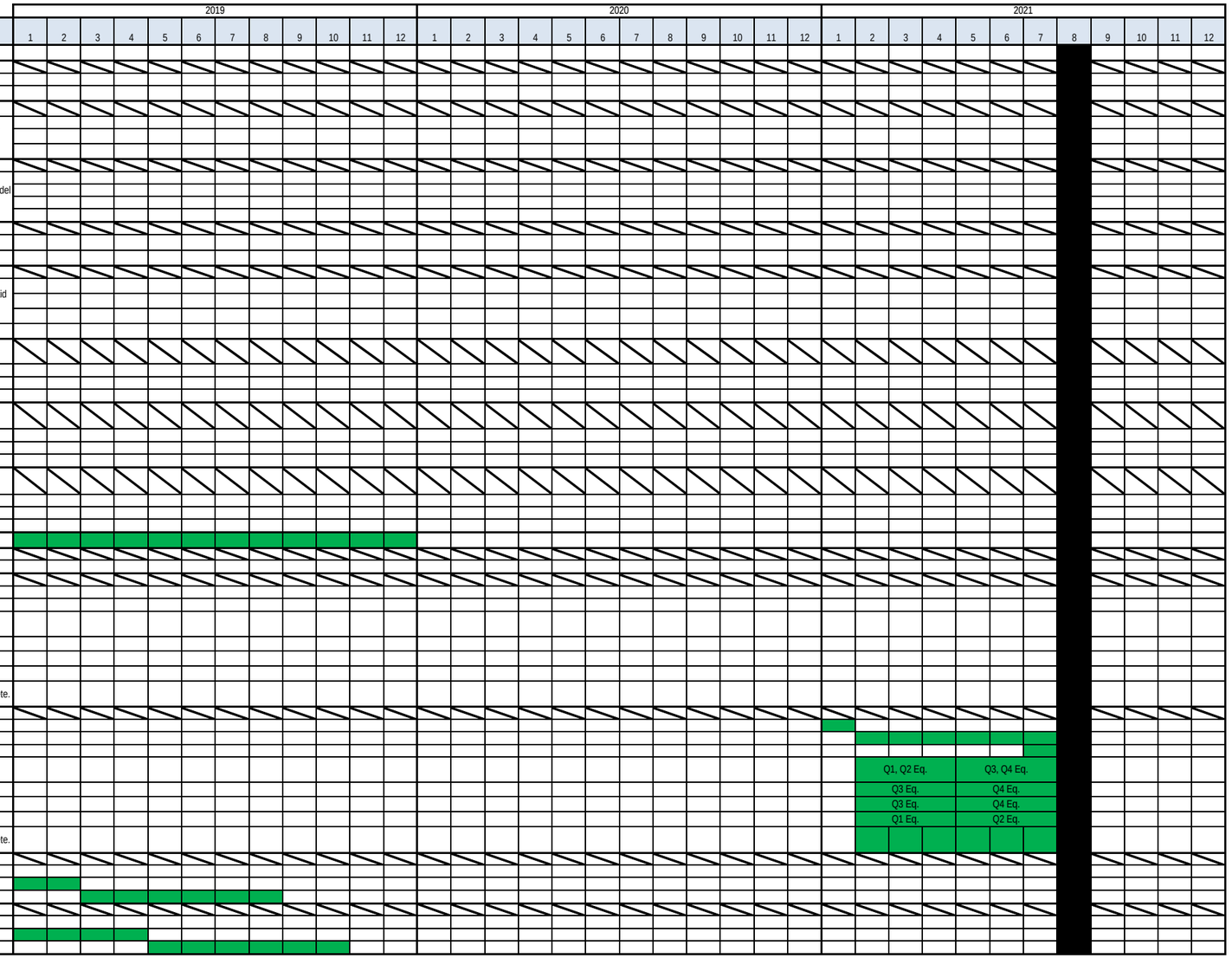
Building Construction	Sep-15	44	
Architectural Coating	May-19	6	



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[9] The Retained Fill: Lay Rail construction phase is presumed to use the same equipment and duration as the Elevated: Lay Rail construction phase.

A.2 Mobilization

Data Used in Calculations

Construction Start Date:	Starts March 2013
Construction Duration (months):	8
Construction Duration (days):	175

Equipment Type	Horsepower	Quantity per Site (Staging Area)	No. of Sites (Staging Areas)	Total Equipment Pieces	Hours per Day	Hours per Year
Flatbed Truck - 1 Ton	175	15	2	30	8	1,400
Flatbed Truck - 5 Ton	210	15	2	30	8	1,400
Flatbed Tractor/Trailer	500	30	2	60	8	1,400
Service Truck - Fuel/Lube	300	5	2	10	8	1,400
Water Truck	210	5	2	10	8	1,400
Light Plant - 4 Lights	10	10	2	20	8	1,400
Truck dump 18 CY Triaxle	200	5	2	10	8	1,400
Boom Truck - 20 Ton	330	5	2	10	8	1,400
CAT 416E Backhoe	87	2	2	4	8	1,400
CAT 330 2.5 CY Excavator	300	1	2	2	8	1,400
CAT D6K Dozer	125	2	2	4	8	1,400

Assumptions:

Assume 5 work days per week (URBEMIS2007 default).

Assume mass site grading rather than fine site grading. Fine site grading is the default.

Assume no material hauling or grading activities associated with mobilization, only equipment operation.

The URBEMIS2007 defaults for the total area graded and maximum daily area disturbed were overwritten with a value of 0.0.

Use a site-specific Land Use Category, similar to the Industrial Park, in URBEMIS2007.

Land Use was based on the total alignment footprint.

Land Use was conservatively set to the footprint of the longest Alternative (BNSF Ave 24) (53,121,779 square feet). See the 'Alignment' tab for details.

Assumed a load factor of 0.65 for all equipment pieces, as recommended by the engineering team of URS.

The hours per year are assigned to the year 2013 because all activity occurs in 2013.

Equipment list provided by A. Tamahne/URS and confirmed by J. Valsecchi/CH2M HILL (3/21/11).

Equipment engines were assumed to be built or rebuilt in the year 2005, based on recommendations provided by the engineering team of URS.

Programmatic mitigation included: water unpaved access roads 3x daily and reduce speed on unpaved roads to less than 15 mph.

A PM reduction of 69% was applied to the equipment loading/unloading per SCAQMD Guidance (Table XI-A Mitigation Measure Examples: Fugitive Dust from Construction & Demolition).

Exhaust emissions were not controlled in URBEMIS2007 as the default, unmitigated emission factors used by URBEMIS2007 create a fleet-average Tier 2 mix.

Mitigation was applied externally to the exhaust emissions based on the fleet-average Tier mix and the required % reductions to meet Tier 4 standards, based on SCAQMD Table II - Off-Road Engine Emission Rates & Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rates.

A.3 Demolition

Data used in calculations

Construction Start Date:	Apr-13
Construction Duration (months):	5
Construction Duration (days):	110

Project Data

		Number of Displaced Structures							
Observed Land Use	Average Approximate Size (sqft)	UPRR/SR 99 Alternative	BNSF Alternative	Hybrid Alternative	CCC	Fagundes	Harris-DeJager	Kojima	Gordon Shaw
Ag	75,000	60	31	61	0	0	0	5	0
Ag/Res	2,500	66	109	89	22	21	0	5	4
Ag/Com	50,000	1	0	0	0	0	0	0	0
Ag/Ind	50,000	23	3	6	0	0	0	0	15
Com	50,000	275	233	225	41	0	0	0	8
Com/Ind	50,000	21	0	12	0	0	0	0	0
Com/MFR	20,000	13	13	13	5	0	0	0	0
Com/Res	2,000	15	13	11	0	0	0	0	0
Comm/Park	3,000	0	0	0	0	0	0	0	0
Hospital/Health	74,600	4	4	4	0	0	0	0	0
Ind	50,000	51	36	32	8	0	0	0	0
MFR	15,000	44	39	39	19	0	0	0	0
Mun	3,000	26	39	24	4	0	0	0	0
Religious/Church	20,000	2	0	1	2	0	0	0	0
School	80,000	0	0	0	10	0	0	0	0
SFR	2,000	232	207	210	16	0	0	0	3
Utility/Railroad	1,000	27	5	21	1	0	0	0	0
Vacant	Not Applicable	3	0	1	0	0	0	0	0
Total Size (sqft)		25,072,400	17,902,900	20,245,900	3,775,000	52,500	0	387,500	1,166,000

Data to be Used in URBEMIS

Component	Total Size (sqft)	Length and Width Dimensions (ft)	Daily Length and Width Dimensions (ft)	Assumed Height (ft)	Modeled (Y / N)
UPRR Alternative	25,072,400	5,007.2	477.4	40	Y
BNSF Alternative	17,902,900	4,231.2	403.4	40	Y
Hybrid Alternative	20,245,900	4,499.5	429.0	40	Y
HMF - CCC	3,775,000	1,942.9	185.3	40	Y
HMF - Fagundes	52,500	229.1	21.8	40	N
HMF - Harris-DeJager	0	N/A	N/A	N/A	N/A
HMF - Kojima	387,500	622.5	59.4	40	N
HMF - Gordon Shaw	1,166,000	1,079.8	103.0	40	N

N/A means that no structures are demolished as a part of the build such that the calculation of additional data is not applicable.

Assumptions:

For Demolition, assume default URBEMIS2007 number of workers (125% of # of construction equipment) and no vendors.
The demolition equipment was selected from Appendix H of the URBEMIS2007 User's Guide, based on the land use area.
Assume 5 work days per week (URBEMIS2007 default).
Use the General Heavy Industry Land Use Category in URBEMIS2007.
Land Use was set equal to the total size of buildings to be demolished (sqft).
Exhaust emissions were not controlled in URBEMIS as the default, unmitigated emission factors used by URBEMIS2007 create a fleet-average Tier 2 mix. As a result, only one URBEMIS2007 run was performed and the results are labeled as "unmitigated".
Mitigation was applied externally to the exhaust emissions based on the fleet-average Tier mix and the required % reductions to reach a Tier 4, based on SCAQMD Table II - Off-Road Engine Emission Rates & Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rates.
As only a total area was provided, the width and length of the buildings were each assumed to be the square root of the total area.
Daily area disturbed was estimated using the total area provided and the approximate duration of construction activities.
The approximate duration of construction activities was based on the proposed construction schedule and the assumption that up to 2 city blocks (250 ft in length each) could be demolished in a day.
In the absence of project-specific data, the height of all buildings was assumed to be 40 feet. This is a conservative estimate based on the average heights of city buildings (*Building Height Characteristics in Three U.S. Cities* , Table 2, Brown, Burian, Linger, Velugubantla, and Ratta, 2002).
URBEMIS2007 was used to estimate the exhaust emissions from the on-road vehicles used to haul demolished materials to the nearest landfill.
URBEMIS2007 estimates the haul trips per day as follows: Round trips/day = Total cubic yards to be demolished / days of demolition x 0.25 x 1 trip / 20 cubic yards. The factor of 0.25 is used to reduce the daily volume of material to be demolished by 75% to account for air space.
URBEMIS2007 estimates dust from demolition activities as follows: PM (lbs/day) = (0.00042 lbs/cubic ft) x Width (ft) x Length (ft) x Height (ft) / Number of Days
Dust emissions from demolition activities were not mitigated as they cannot be controlled by watering the ground; this is dust from actual building materials.
All demolition data were taken from Table A-12c from AppA9-12-Impact-Perm06012011MB.xlsx as provided by L. Black to E. Pieper (6/2/11). Full and partial listings were summed for each category.
The average approximate structure size (sqft) for the Ag/Ind and Ag/Com categories were assumed equal to that of the Ind and Com categories, respectively, per recommendation by L. Black (2/28/11).
The structure sizes for the remaining categories were from CHSR_Displacement_Structures_AQ_20100806_Revised-08172010_JP as provided by L. Black to A. White (8/17/10).
As a conservative approach, only the worst-case numbers of displaced structures were used for each Alternative, regardless of the Wye option associated with that Alternative.
The structures to be demolished as a result of the Merced and Fresno Train Stations are included in the listings for each Alternative.
Since only one Fresno Train Station will be built, the listings above only include demolished structures for one of the two Fresno Train Station options (whichever had the higher number of structures).
Only permanent impacts were considered as once structures are demolished, they will not be rebuilt or repaired.
Since only one HMF will be built, the HMF with the most structures to be demolished (HMF - Castle Commerce Center) was modeled to represent the worst-case of all possible HMF options.

A.4 Rail Line: Alignment

Data Assumed Based on Provided Data
Data Used in Calculations

					At-Grade Rail Length		Elevated Rail Length		Retained Fill Rail Length		Material-Scaled Length					
Alternatives	Length (Miles)	At-Grade Length (miles)	Elevated Length (miles)	Retained Fill Length (miles)	2 Tracks (miles)	4 Tracks (miles)	2 Tracks (miles)	4 Tracks (miles)	2 Tracks (miles)	4 Tracks (miles)	At-Grade (miles)	Elevated (miles)	Retained Fill (miles)	Width of Area Cleared (ft)	Total Area Cleared (acres)	Total Area Cleared (sqft)
BNSF Ave 21	81.70	67	13	2	61.74	4.92	12.13	0.90	1.70	0.30	71.58	13.93	2.30	120	1,188.31	51,762,897
BNSF Ave 24	83.84	68	14	2	67.21	0.67	9.17	4.79	1.70	0.30	68.54	18.74	2.30	120	1,219.51	53,121,779
UPRR Ave 21	72.32	36	35	1	33.77	2.20	28.91	6.10	0.93	0.40	38.17	41.11	1.73	120	1,051.87	45,819,340
UPRR Ave 24	74.36	43	30	1	39.92	3.58	24.80	4.72	0.95	0.40	47.08	34.24	1.75	120	1,081.64	47,116,311
HMF Track	7.60	4	2	1	1.00	3.03	1.47	0.78	1.33	0.00	7.06	3.02	1.33	120	110.62	4,818,457
Hybrid Ave 24	64.08	58	5	1	52.83	5.10	4.74	0.00	1.11	0.30	63.03	4.74	1.71	120	932.09	40,601,825
Hybrid Ave 21	72.76	52	19	1	48.40	3.50	18.55	0.90	1.11	0.30	55.40	20.35	1.71	120	1,058.29	46,099,277

Notes:
Data taken from AQ_lengths of alternatives_20110602.xlsx as provided by L. Black to K. Skadberg (6/2/11)
Width of Area Cleared assumed to be a conservative, reasonable average of the area cleared for the different track widths (2 tracks and 4 tracks), including a buffer area.
The Width of Area Cleared is a conservative estimate provided by L. Black on 1/5/2011 (RE: Land Acquisition_ROW.msg) and confirmed by C. Montague on 1/6/2011 (RE: Land Acquisition_ROW(2).msg
It is assumed that the same distance is cleared in both directions from the centerline
The material quantities given on the 'Material Hauling' tab are for a 2-track width
The UPRR Ave 24 option was taken as the East Chow/24 option since it had a longer length than the West Chow/24 optior
The HMF Track was taken as the Castle Commerce Center HMF option since it had the longest length of the HMF options
The material-scaled length accounts for an increase or decrease in materials required to construct the at-grade, elevated, and retained fill rail segments based on the track width; track widths were scaled as follows

2 Tracks	1	All the material quantity required for 2 tracks
4 Tracks	2	Twice the material quantity required for 4 tracks

General Assumptions:
Assume 2.5 by 2.5 feet of trench for the entire at-grade alignment
Will analyze the BNSF Ave 21, BNSF Ave 24, UPRR Ave 21, UPRR Ave 24, Hybrid Ave 24, Hybrid Ave 21, and HMF options independently, using the same approach and assumptions.
Only operational emissions associated with alignment were for train wake dust. This was calculated based on EPA AP-42 methodology and the length of the at-grade alignmen
Emissions associated with material hauling (ballast, rail, etc.) will be calculated independently of the alignment construction. See the 'Material Hauling' tal
The alignment will be constructed in 4 unique phases: Site Preparation (including land clearing), Earth Moving (including grading, trenching, and cut/fill activities), Constructing Elevated Structures, and Laying Trac
No paving activities will occur as the alignment will be concrete and steel, not asphalt; the concrete and steel elements are included in the Construction of Elevated Structures phas
No architectural coating activities will occur as the structures being constructed will not require painting

Land Preparation Assumptions:
Will use URBEMIS2007 to calculate emissions from the Site Preparation and Earth Moving phases
Use the General Light Industry Land Use Category in URBEMIS2007
Land Use was based on the total acres to be cleared based on the total length of the alignment
Assume 5 work days per week (URBEMIS2007 default).
Assume mass site grading rather than fine site grading. Fine site grading is the default
Site preparation (land clearing) will be modeled in its own URBEMIS2007 run as a mass site grading phase; each Alternative will have its own unique run
Earth moving will be modeled using 2 unique mass site grading phases. The first is for grading and the second for cut/fill activities. This was the only option in URBEMIS2007 that would capture fugitive dust emissions from these specific activities. Again, each Alternative will have its own unique r
For the Cut/Fill phase: assume all cut is excavated onsite and exported offsite and assume all fill is imported from offsite and distributed onsite using a scrape
For the Cut/Fill phase: soil hauling estimates were not included in URBEMIS2007 as material hauling was calculated externally
For the Cut/Fill phase, the low level of fugitive emissions were used (instead of the default level) because specific cut / fill volumes were known
It was assumed that soil hauling activities were only associated with the Cut/Fill phase
Trenching will be intended to include laying utilities below ground; this was the most appropriate option in URBEMIS2007
For grading phases, URBEMIS2007 assumes the total acres graded are 2x the building area; overwrote the total acres graded with the actual alignment acres
For grading phases, URBEMIS2007 assumes the daily acres graded are 25% of the total acres graded; overwrote the daily acres graded with 0.5 acres (as provided by J. Valsecchi)
Programmatic mitigation for fugitive dust included: equipment loading/unloading (trucks hauling loose materials must be covered), replace ground cover in disturbed areas quickly, water exposed surfaces 2x daily, water unpaved access roads 3x daily, and reduce speed on unpaved roads to less than 15 mp
Mitigation for fugitive dust included: water exposed surfaces 3x daily
The fugitive dust mitigation measures were applied based on the SJVAPCD Rule 8021; the most stringent watering techniques were applied
A PM reduction of 69% was applied to the equipment loading/unloading per SCAQMD Guidance (Table XI-A Mitigation Measure Examples: Fugitive Dust from Construction & Demolition
Exhaust emissions were not controlled in URBEMIS2007 as the default, unmitigated emission factors used by URBEMIS2007 create a fleet-average Tier 2 mix
Mitigation was applied externally to the exhaust emissions based on the fleet-average Tier mix and the required % reductions to meet Tier 4 standards, based on SCAQMD Table II - Off-Road Engine Emission Rates & Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rate
Mitigation was applied to the fugitive dust from Cut/Fill activities by reducing the offsite Cut/Fill material movement to 0 cy/day in URBEMIS2007. It is assumed that by covering the haul trucks with tarp, fugitive dust emissions will be reduced approximately 100
Equipment estimates entered into URBEMIS2007 are provided on the 'Land Prep Equipment' tab
For Grading and Trenching, assume default URBEMIS2007 number of workers (125% of # of construction equipment) and no vendors
Project-specific data was used to define the project phases. See the 'Schedule' tab for details
The Site Preparation and Earth Moving phases were not included for the HMF track; it was assumed that any relevant clearing and grading was performed during the construction of the HMF building
The Site Preparation and Earth Moving phases were modeled for the specific length of each alternative. As a result, the URBEMIS2007 results did not require any additional scaling

A.4 Rail Line: Alignment

Data Assumed Based on Provided Data

Data Used in Calculations

Elevated Structures / Laying Track Assumptions:

1,000 linear feet of alignment can be constructed in 1 year

Equipment estimates were provided by J. Valsecchi per 1,000 linear feet of alignment and are included on the 'Rail Equipment' tab

Estimates were provided by quarter of construction phase (Q1, Q2, Q3, and Q4)

For the At-Grade Alignment, it was presumed that Q1 represents the 1st quarter of the calendar year, etc. and that rail and ballast are laid simultaneously

For the Elevated Structures, it was presumed that Q1 and Q2 of the Elevated Equipment (see 'Rail Equipment' Tab) are each 3-month cycles that only account for building structures used to support the rail. These quarters are repeated for a complete yea

For the Elevated Alignment, it was presumed that Q3 and Q4 of the Elevated Equipment (see 'Rail Equipment' Tab) are each 3-month cycles that only account for laying of the rail. These quarters are repeated for a complete yea

The equipment and schedule for the Retained Fill Alignment was presumed to be identical to the Elevated Alignmen

The quarterly cycles were repeated at a frequency and overlapped as specified on the 'Schedule' tab

For the BNSF, UPRR, and Hybrid Alternatives, will use URBEMIS2007 to calculate emissions from the constructing elevated structures and laying of track for 1 representative year only.

For BNSF, UPRR, and Hybrid Alternative Laying Track and Elevated Structures phases, the year 2014 was modeled as the representative year because it was the first full year of construction for all 3 phases

For the LMF and HMF, will use URBEMIS2007 to calculate emissions from the constructing elevated structures and laying of track for the schedule as presented on the 'Schedule' tab. As a result, 2 separate URBEMIS2007 runs will be performe

The annual URBEMIS2007 results were scaled using the following equation: Summed Emissions (tpy) x Material-Scaled Length (ft) / 1,000 (ft/yr) / Construction Duration (yr)

The Material-Scaled Length accounts for an increase or decrease in materials required to construct the at-grade, elevated, and retained fill rail segments based on the track width

Use the General Light Industry Land Use Category in URBEMIS2007. This input only impacts the estimated worker trips per construction phase

Land Use was entered as 120,000 sqft (1,000 linear feet x 120 ft width). The width is the same assumption used for Land Preparation while the length is based on the equipment counts provided

Assume 5 work days per week (URBEMIS2007 default).

The elevated structures and laying track activities will be modeled as a building construction phase with each quarter representing its own unique building phase

Exhaust emissions were not controlled in URBEMIS2007 as the default, unmitigated emission factors used by URBEMIS2007 create a fleet-average Tier 2 mix

Mitigation was applied externally to the exhaust emissions based on the fleet-average Tier mix and the required % reductions to meet Tier 4 standards, based on SCAQMD Table II - Off-Road Engine Emission Rates & Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rate

Equipment was entered into URBEMIS2007 assuming a whole number of equipment. If the equipment usage on the 'Rail Equipment' tab was greater than 0, 1 equipment piece was entered, regardless of if the usage was greater than 1 or no

The URBEMIS2007 default hours of daily operation were overwritten with numbers estimated on the 'Rail Equipment' tab using project-specific data. The daily hours were determined by the following equation: 8 hours per day x Equipment Usag

For building construction, assume the default URBEMIS2007 load factors for each equipment type specified

For building construction, assume the default URBEMIS2007 number of worker trips (0.42 trips / 1,000 sqft). This results in an employee count of approximately 72 per day. URBEMIS2007 also assumes approximately 21 miles traveled per round tri

For building construction, URBEMIS2007 provides a default number of vendor trips (0.38 trips / 1,000 sqft). This value was overwritten to indicate 0 vendor trips during alignment construction

For the At-Grade Alignment, the Rail Swing was entered as "Other General Industrial Equipment" with a horsepower of 500

For the At-Grade Alignment, the Rail Tamper was entered as "Other Equipment" with a horsepower of 400

For the At-Grade Alignment, the Surface Aligning Machine was entered as "Other Material Handling Equipment" with a horsepower of 400

For the At-Grade Alignment, the URBEMIS2007 default horsepower for the Generator Sets was 49. This value was overwritten with the project specific value of 549

For the Elevated Alignment, the Rail Swing was entered as "Other General Industrial Equipment" with a horsepower of 500

For the Elevated Alignment, the Concrete Pumps were entered as "Pumps" with a horsepower of 600

For the Elevated Alignment, the URBEMIS2007 default horsepower for the Generator Sets was 49. This value was overwritten with the project specific value of 549

Fugitive dust caused by construction equipment during the elevated structures and laying track activities were modeled outside of URBEMIS2007 using the URBEMIS2007 default PM emission factor for mass site grading, assuming watering twice dail

$PM_{2.5}$ fugitive dust emissions during the elevated structures and laying track activities were assumed equal to 20.8% of the PM_{10} emissions, based on Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

A.5 Alignment: Land Prep Equipment

Data Used in Calculations

Assumptions:

This information is only for the site preparation and earth moving phases of the alignment construction. Equipment for the elevated structures and rail can be found on the 'Rail Equipment' tab.
Tables below show the default number of equipment selected in the Roadway Construction Emissions Model (RCEM) vs. URBEMIS2007.
Tables also provide the project-specific equipment counts (provided by J. Valsecchi/CH2M HILL) that will be used in the construction calculations. Data provided was for the BNSF Alternative.
Assumed the same number of equipment for the UPRR and Hybrid Alternatives as for the BNSF Alternative.
N/A in the below tables indicates the equipment is not applicable and will not be used.
Land Clearing will occur under the Site Preparation phase. Grading, Trenching, and Cut/Fill will occur under the Earth Moving phase.
Assumptions regarding how the below phases were modeled are included on the 'Alignment' tab.

Land Clearing

Construction Start Date:	April-13
Construction Duration (months):	5

Assume only 0.5 acres max graded per day (provided by J. Valsecchi).
All equipment assumed to operate 8 hours/day.

Equipment Type	# of RCEM Equipment	# of URBEMIS Equipment	# of Equipment Provided by J. V.
Excavators	0	3	1
Rubber Tired Dozers	4	2	2
Scrapers	7	0	1
Signal Boards	166	0	N/A
Water Trucks	4	0	1

Grading

Construction Start Date:	August-13
Construction Duration (months):	6

RCEM Assumptions: 604 acres with 3.4 acres/day over 8.1 months.
URBEMIS2007 Assumptions: Equipment count for 189+ acres regardless of project duration.
Assume only 0.5 acres max graded per day (provided by J. Valsecchi).
All equipment assumed to operate 8 hours/day.

Equipment Type	# of RCEM Equipment	# of URBEMIS Equipment	# of Equipment Provided by J. V.
Excavators	1	0	1
Graders	1	2	2
Rubber Tired Dozers	0	3	2
Rubber Tired Loaders	1	0	2
Scrapers	1	6	1
Signal Boards	166	0	N/A
Plate Compactor	0	1	1
Water Trucks	1	2	1

Trenching

Construction Start Date:	February-14
Construction Duration (months):	6

RCEM Assumptions: 604 acres with 3.4 acres/day over 8.1 months.
URBEMIS2007 Assumptions: Equipment count for 90+ acres regardless of project duration.
All equipment assumed to operate 8 hours/day.

Equipment Type	# of RCEM Equipment	# of URBEMIS Equipment	# of Equipment Provided by J. V.
Graders	1	0	1
Plate Compactors	1	0	1
Scrapers	1	0	0
Signal Boards	166	0	N/A
Trenchers	1	0	1
Water Trucks	1	0	1
Other Industrial	0	2	0
Loader	0	2	0
Excavator	0	4	0

Cut and Fill

Construction Start Date:	September-13
Construction Duration (months):	24

Assume only 0.5 acres max graded per day (provided by J. Valsecchi).
Project-specific equipment counts not provided so J. Valsecchi confirmed the use of the URBEMIS2007 defaults.
Amount of material moved daily included on the 'Material Hauling' tab.
Used URBEMIS2007 default equipment hours of operation.

Equipment Type	# of Equipment Provided by J. V.
Grader	1
Rubber Tired Dozer	1
Tractors / Loaders / Backhoes	1
Water Trucks	1

A.6 Rail Line: Rail Equipment

Elevated Alignment Construction

# of days per year 280 --> 70 days/quarter

Model Equipment Types	Model Default Values	Equipment Parameters			# of Equipment * Days used for Entire Project	Percent Usage				# of equipment used per day for Elevated Rail Construction				# of hours per day 1 piece of each equipment type is used for Elevated Rail Construction			
	Load	Fuel Type	Horsepower	Hours Per Day		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Aerial Lifts	0.46	Diesel	60	8	125	0%	20%	40%	40%	0.0	0.4	0.7	0.7	0.0	2.9	5.7	5.7
Air Compressors	0.48	Diesel	106	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Bore/Drill Rigs	0.75	Diesel	291	8	75	100%				1.1	0.0	0.0	0.0	8.6	0.0	0.0	0.0
Cement and Mortar Mixers	0.56	Diesel	10	8	100	10%	10%	40%	40%	0.1	0.1	0.6	0.6	1.1	1.1	4.6	4.6
Concrete/Industrial Saws	0.73	Diesel	10	8	100				100%	0.0	0.0	0.0	1.4	0.0	0.0	0.0	11.4
Cranes	0.43	Diesel	399	8	125		50%	50%		0.0	0.9	0.9	0.0	0.0	7.1	7.1	0.0
Crawler Tractors	0.64	Diesel	147	8	60	100%				0.9	0.0	0.0	0.0	6.9	0.0	0.0	0.0
Crushing/Processing Equipment	0.78	Diesel	142	8	0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dumpers/Tenders	0.38	Diesel	16	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Excavators	0.57	Diesel	168	8	20	100%				0.3	0.0	0.0	0.0	2.3	0.0	0.0	0.0
Forklifts	0.30	Diesel	145	8	100	100%				1.4	0.0	0.0	0.0	11.4	0.0	0.0	0.0
Generator Sets	0.74	Diesel	549	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
Graders	0.61	Diesel	174	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
Off Highway Tractors	0.65	Diesel	267	8	100	100%				1.4	0.0	0.0	0.0	11.4	0.0	0.0	0.0
Off Highway Trucks	0.57	Diesel	479	8	75	25%	25%	25%	25%	0.3	0.3	0.3	0.3	2.1	2.1	2.1	2.1
Plate Compactors	0.43	Diesel	8	8	100	100%				1.4	0.0	0.0	0.0	11.4	0.0	0.0	0.0
Pressure Washers	0.60	Diesel	1	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
Rollers	0.56	Diesel	95	8	50				100%	0.0	0.0	0.0	0.7	0.0	0.0	0.0	5.7
Rough Terrain Forklifts	0.60	Diesel	93	8	50	100%				0.7	0.0	0.0	0.0	5.7	0.0	0.0	0.0
Scrapers	0.72	Diesel	313	8	50	100%				0.7	0.0	0.0	0.0	5.7	0.0	0.0	0.0
Signal Boards	0.78	Diesel	15	8	0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skid Steer Loaders	0.55	Diesel	44	8	50	100%				0.7	0.0	0.0	0.0	5.7	0.0	0.0	0.0
Surfacing Equipment	0.45	Diesel	362	8						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sweepers/Scrubbers	0.68	Diesel	91	8	50				100%	0.0	0.0	0.0	0.7	0.0	0.0	0.0	5.7
Tractors/Loaders/Backhoes	0.55	Diesel	108	8	150	25%	25%	25%	25%	0.5	0.5	0.5	0.5	4.3	4.3	4.3	4.3
Trenchers	0.75	Diesel	63	8	100	100%				1.4	0.0	0.0	0.0	11.4	0.0	0.0	0.0
Water Trucks	0.50	Diesel	189	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Welders	0.45	Diesel	45	8	200	25%	25%	25%	25%	0.7	0.7	0.7	0.7	5.7	5.7	5.7	5.7
rail swing	0.51	Diesel	500 hp	8	120			50%	50%	0.0	0.0	0.9	0.9	0.0	0.0	6.9	6.9
Rail Tamper	0.62	Diesel	1,000 hp	8	0			50%	50%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surface aligning machine	0.59	Diesel	1,000 hp	8	0				100%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Pumps	0.74	Diesel	600 hp	8	50	100%				0.7	0.0	0.0	0.0	5.7	0.0	0.0	0.0
										total # eq on site							
										21	12	13	15				

Assumptions:

This data is only for the structure, rail, and ballast calculations.

Equipment counts are provided for 1,000 linear feet. 1,000 linear feet of alignment are constructed in 1 year.

The # of Equipment x Days used for Entire Project and the Percent Usage for each rail type were provided by J. Valsecchi.

The retained fill alignment will be constructed with equipment similar to the elevated rail.

Each year has 280 days of workable time.

Application of the above data in the URBEMIS2007 model is explained on the 'Alignment' tab.

A.6 Rail Line: Rail Equipment

At-Grade Alignment Construction

# of days per year 280 --> 70 days/quarter

Model Equipment Types	Model Default Values	Equipment Parameters			# of Equipment * Days used for Entire Project	Percent Usage				# of equipment used per day for At-Grade Rail Construction				# of hours per day 1 piece of each equipment type is used for At-Grade Rail Construction			
	Load	Fuel Type	Horsepower	Hours Per Day		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Aerial Lifts	0.46	Diesel	60	8	40	100%	0%	0%	0%	0.6	0.0	0.0	0.0	4.6	0.0	0.0	0.0
Air Compressors	0.48	Diesel	106	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Bore/Drill Rigs	0.75	Diesel	291	8	0	100%				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cement and Mortar Mixers	0.56	Diesel	10	8	10	25%	25%	25%	25%	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
Concrete/Industrial Saws	0.73	Diesel	10	8	10	25%	25%	25%	25%	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3
Cranes	0.43	Diesel	399	8	25		50%	50%		0.0	0.2	0.2	0.0	0.0	1.4	1.4	0.0
Crawler Tractors	0.64	Diesel	147	8	150	25%	25%	25%	25%	0.5	0.5	0.5	0.5	4.3	4.3	4.3	4.3
Crushing/Processing Equipment	0.78	Diesel	142	8	0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dumpers/Tenders	0.38	Diesel	16	8	150	25%	25%	25%	25%	0.5	0.5	0.5	0.5	4.3	4.3	4.3	4.3
Excavators	0.57	Diesel	168	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
Forklifts	0.30	Diesel	145	8	20	25%	25%	25%	25%	0.1	0.1	0.1	0.1	0.6	0.6	0.6	0.6
Generator Sets	0.74	Diesel	549	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
Graders	0.61	Diesel	174	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Off Highway Tractors	0.65	Diesel	267	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Off Highway Trucks	0.57	Diesel	479	8	125	25%	25%	25%	25%	0.4	0.4	0.4	0.4	3.6	3.6	3.6	3.6
Plate Compactors	0.43	Diesel	8	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Pressure Washers	0.60	Diesel	1	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
Rollers	0.56	Diesel	95	8	125	25%	25%	25%	25%	0.4	0.4	0.4	0.4	3.6	3.6	3.6	3.6
Rough Terrain Forklifts	0.60	Diesel	93	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
Scrapers	0.72	Diesel	313	8	125	25%	25%	25%	25%	0.4	0.4	0.4	0.4	3.6	3.6	3.6	3.6
Signal Boards	0.78	Diesel	15	8	0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skid Steer Loaders	0.55	Diesel	44	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Surfacing Equipment	0.45	Diesel	362	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Sweepers/Scrubbers	0.68	Diesel	91	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
Tractors/Loaders/Backhoes	0.55	Diesel	108	8	150	25%	25%	25%	25%	0.5	0.5	0.5	0.5	4.3	4.3	4.3	4.3
Trenchers	0.75	Diesel	63	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Water Trucks	0.50	Diesel	189	8	150	25%	25%	25%	25%	0.5	0.5	0.5	0.5	4.3	4.3	4.3	4.3
Welders	0.45	Diesel	45	8	50	25%	25%	25%	25%	0.2	0.2	0.2	0.2	1.4	1.4	1.4	1.4
rail swing	0.51	Diesel	500 hp	8	150	25%	25%	25%	25%	0.5	0.5	0.5	0.5	4.3	4.3	4.3	4.3
Rail Tamper	0.62	Diesel	400 hp	8	150	25%	25%	25%	25%	0.5	0.5	0.5	0.5	4.3	4.3	4.3	4.3
Surface aligning machine	0.59	Diesel	400 hp	8	100	25%	25%	25%	25%	0.4	0.4	0.4	0.4	2.9	2.9	2.9	2.9
Concrete Pumps	0.74	Diesel	600 hp	elevated only	0	elevated only				elevated only				elevated only			
										total # eq on site							
										27	27	27	26				

Assumptions:

This data is only for the structure, rail, and ballast calculations.

Equipment counts are provided for 1,000 linear feet. 1,000 linear feet of alignment are constructed in 1 year.

The # of Equipment x Days used for Entire Project and the Percent Usage for each rail type were provided by J. Valsecchi.

The retained fill alignment will be constructed with equipment similar to the elevated rail.

Each year has 280 days of workable time.

Application of the above data in the URBEMIS2007 model is explained on the 'Alignment' tab.

A.7 Summary of Roadway Projects

Summary of Projects by Alternative

Alternative	Average Length of Structures (< 1 Mile)	Average Length of Roadways < 1 Mile	Average Length of Roadways < 2.5 Miles	Average Length of Roadways > 2.5 Miles
BNSF Ave 21	0.086	0.374	1.482	4.201
BNSF Ave 24	0.081	0.372	1.546	4.201
UPRR Ave 21	0.103	0.414	1.752	4.752
UPRR Ave 24	0.096	0.390	1.742	4.900
Hybrid Ave 24	0.085	0.365	1.948	6.027
Worst-Case Average [1, 2]	0.103	0.414	1.948	6.027
Worst-Case Alternative	UPRR Ave 21	UPRR Ave 21	Hybrid Ave 24	Hybrid Ave 24

Notes:

[1] Will use the Worst-Case Average as input to the Road Construction Emissions Model to determine a conservative, representative scenario to model in URBEMIS2007.

[2] Assumed that the addition of the Hybrid Ave 21 Alternative would have negligible impact on the worst-case average; therefore, its average project lengths are not summarized above.

Summary of SAC Roadway Model Inputs

Input Parameter	Average Length of Structures (< 1 Mile)	Average Length of Roadways < 1 Mile	Average Length of Roadways < 2.5 Miles	Average Length of Roadways > 2.5 Miles
Construction Start Year [1]	2013	2017	2015	2014
Project Type [2]	Bridge/Overpass	New Road	New Road	New Road
Project Construction Time (months)	12	12	24	30
Predominant Soil Type [3]	Sand Gravel	Sand Gravel	Sand Gravel	Sand Gravel
Project Length (miles)	0.103	0.414	1.948	6.027
Total Project Area (acres) [4]	0.598	2.411	11.334	35.069
Maximum Area Disturbed/Day (acres) [5]	0.5	0.5	0.5	0.5
Water Trucks Used (Y/N) [6]	No	No	No	No
Soil Imported (cy/day) [7]	0	0	0	0
Soil Exported (cy/day) [7]	0	0	0	0
Average Truck Capacity (cy)	20	20	20	20

Notes:

[1] Construction Start Year based on the schedule provided by the PMT, presented on the 'Schedule' tab.

[2] Will model all roadway projects as new road construction.

[3] Predominant Soil Type in the project vicinity was determined to be sand gravel by S. McGinnis (5/27/10).

[4] Total Project Area (acres) assumes the width of a 4-lane road (48 feet). This project area will be entered into URBEMIS2007 as the Land Use.

[5] The maximum area disturbed/day (acres) was assumed equal to that for the alignment earth moving activities.

[6] One water truck will be added for fugitive dust control within the URBEMIS2007 model, not the Road Construction Emissions Model.

[7] Emissions from soil hauling activities will be estimated under Material Hauling and were, therefore, excluded from this phase.

A.8 BNSF Ave 21: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace	Included in Regional Transportation Plan	Roadway Realignment Length		Structure Length		Data Tab
	R, N, G, Replace	(Y/N)	FT	Miles	FT	Miles	
Fresno County							
SR 99	R	Y	12,400	2.35			Fresno County
Motel Dr (South of Clinton)	R	N	1,700	0.32			Fresno County
Connection from Motel Dr to NB Offramp	R	N	1,000	0.19			Fresno County
SB offramp to Motel Dr (Clinton area)	R	N	1,500	0.28			Fresno County
SB onramp from Clinton	N	N	1,700	0.32			Fresno County
Clinton Ave	Replace	N	2,500	0.47	725	0.14	Fresno County
Pleasant Ave to Woodson Ave	N	N	1,000	0.19			Fresno County
Woodson Ave	R	N	1,000	0.19			Fresno County
Valentine Ave to Dakota Ave	R	N	1,400	0.27			Fresno County
SB offramp to Motel Dr (Ashlan area)	R	N	1,300	0.25			Fresno County
NB offramp to Motel Dr (Ashlan area)	R	N	1,000	0.19			Fresno County
Motel Dr (Ashlan area)	R	N	2,100	0.40			Fresno County
Ashlan Ave	R	N	2,200	0.42	550	0.10	Fresno County
Motel Dr (North of Ashlan)	R	N	23,800	4.51			Fresno County
SB offramp from Golden State Blvd (North of Herndon)	R	N	500	0.09			Fresno County
NB onramp to Golden State Blvd (North of Herndon)	R	N	2,500	0.47			Fresno County
Shaw Ave	G	Y	3,100	0.59	650	0.12	Fresno County
Cornelia	Replace	N	3,600	0.68			Fresno County
Clinton Ave		N					F4
North Golden State Blvd	R	N	4,500	0.85			F4
W McKinley Ave	G	N			375	0.07	F4
Connector between W McKinley Ave and N Golden State Blvd	R	N	650	0.12			F4
N Weber Ave	R	N	360	0.07			F4
N West Ave	R	N	500	0.09			F4
W Olive Ave	G	N			625	0.12	F4
Belmont Ave	G	N			630	0.12	F4
H Street/N Weber Ave	R	N	1,200	0.23			F4
N Wesley Ave	R	N	470	0.09			F4
Neilson Ave	R	N	300	0.06			F4
Stainislaus St	G	N			780	0.15	F4
Tuolumne St	G	N			780	0.15	F4
Fresno St	G	N					F4
G Street at Fresno Street	G	N			160	0.03	F4
Tulare St (overpass option)	G	N			780	0.15	F4
Tulare St (underpass option)	G	N					F4
G Street at Tulare St (underpass option only)	G	N			160	0.03	
Ventura St	G	N			830	0.16	F4
Golden State Blvd Ramps		N					F4
SR41		N					F4
Bullard Ave	N	Y	3,200	0.61			Coordination Meeting
Veterans Blvd	N	Y	2,550	0.48	450	0.09	Coordination Meeting
Golden State Blvd	R	Y	2,500	0.47			Coordination Meeting
Total Feet			**80,530**	**15.25**	**7,495**	**1.42**	
Total Number of Overpasses	**12**						
Structures (< 1 Mile)	**13**	**2 RTP-related**					
Roadways < 1 Mile	**26**	**4 RTP-related**					
Roadways < 2.5 Miles	**1**	**1 RTP-related**					
Roadways > 2.5 Miles	**1**						
Madera County							
Road 16	G	N			300	0.06	BNSF (A1-Ave21 Wye)
Road 18 1/2	G	N			310	0.06	BNSF (A1-Ave21 Wye)
Road 20	G	N			385	0.07	BNSF (A1-Ave21 Wye)
Realigned Road West of Road 22	R	N	2,435	0.46			BNSF (A1-Ave21 Wye)
Road 22 @ Ave 21	G	N					BNSF (A1-Ave21 Wye)
Ave 22 (N. Leg)	G	N			230		BNSF (A1-Ave21 Wye)
Ave 20 1/2 (S. Leg) and Road 24	R	N			345	0.07	BNSF (A1-Ave21 Wye)
Access Roads North and South of Ave 20 1/2		N	6,510	1.23			BNSF (A1-Ave21 Wye)
Ave 20	G	N			190	0.04	BNSF (A1-Ave21 Wye)
Ave 26	G	N			490	0.09	BNSF (A1-Ave21 Wye)
Road 22		N	5,400	1.02			BNSF (A1-Ave21 Wye)
Ave 24	G	N					BNSF (A1-Ave21 Wye)
Access Road North of Ave 24		N	3,450	0.65			BNSF (A1-Ave21 Wye)
Road 24	G	N			550	0.10	BNSF (A1-Ave21 Wye)
Access west of Road 24	R	N	7,000	1.33			BNSF (A1-Ave21 Wye)
Ave 20.5	G	N			540	0.10	BNSF (A1-Ave21 Wye)
Frontage Road between Ave 21 and 20 1/2	R	N	4,110	0.78			BNSF (A1-Ave21 Wye)
Road 26	G	N					BNSF (A1-Ave21 Wye)
Hanover Dr parallel to tracks	R	N	2,195	0.42			BNSF (A1-Ave21 Wye)
Lake St	G	N					BNSF (A1-Ave21 Wye)
Ave 17	G	N			460	0.09	BNSF (A1-Ave21 Wye)
Raymond Rd	G	N			325		BNSF (A1-Ave21 Wye)
SR 145	G	N					BNSF (A1-Ave21 Wye)
Road 29 Ave 15 1/2	G	N			595	0.11	BNSF (A1-Ave21 Wye)
Access Road 29	R	N	1,450	0.27			BNSF (A1-Ave21 Wye)
Access Road	R	N	1,000	0.19			BNSF (A1-Ave21 Wye)
Ave 15	G	N			465	0.09	BNSF (A1-Ave21 Wye)
Ave 13	G	N			620	0.12	BNSF (A1-Ave21 Wye)
Road South of Ave 13	G	N	5,150	0.98			BNSF (A1-Ave21 Wye)
Ave 12	G	N			230	0.04	BNSF (A1-Ave21 Wye)
Ave 11	G	N			220	0.04	BNSF (A1-Ave21 Wye)
Ave 10	G	N			250	0.05	BNSF (A1-Ave21 Wye)

A.8 BNSF Ave 21: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace	Included in Regional Transportation Plan	Roadway Realignment Length		Structure Length		Data Tab
	R, N, G, Replace	(Y/N)	FT	Miles	FT	Miles	
Ave 9	G	N			250	0.05	BNSF (A1-Ave21 Wye)
Ave 8	G	N			650	0.12	BNSF (A1-Ave21 Wye)
Road 33	R	N	3,000	0.57			BNSF (A1-Ave21 Wye)
Total Feet			**41,700**	**7.90**	**7,405**	**1.30**	
Total Number of Overpasses	**24**						
Structures (< 1 Mile)	**17**						
Roadways < 1 Mile	**8**						
Roadways < 2.5 Miles	**3**						
Roadways > 2.5 Miles	**0**						
Merced County							
Healy	R	N	2,034	0.39			BNSF (A1-Ave21 Wye)
S. Aboleda Dr	G	N			215	0.05	BNSF (A1-Ave21 Wye)
Plainsburg Rd	G	N			260	0.04	BNSF (A1-Ave21 Wye)
Mariposa Way	G	N			285	0.05	BNSF (A1-Ave21 Wye)
Burchell Av	G	N			530	0.05	BNSF (A1-Ave21 Wye)
Frontage Road West of Burchell	R	N	636	0.12			BNSF (A1-Ave21 Wye)
N. Side Santa Fe Dr La Grand to Ipsen Rd	R	N	3,300	0.63			BNSF (A1-Ave21 Wye)
S. Side Santa Fe Dr. La Grand to Marguerite Rd	R	N	20,565	3.89			BNSF (A1-Ave21 Wye)
Buchanan Hollow Rd	G	N			530	0.10	BNSF (A1-Ave21 Wye)
Santa Fe Dr	G	N			375	0.07	BNSF (A1-Ave21 Wye)
Total Feet			**26,535**	**5.03**	**2,195**	**0.36**	
Number of Overpasses	**6**						
Structures (< 1 Mile)	**6**						
Roadways < 1 Mile	**3**						
Roadways < 2.5 Miles	**0**						
Roadways > 2.5 Miles	**1**						

Notes:
1 Did not consider any alternative design options.
2 Fresno County data north of Clinton taken from Fresno_Crossing_Data.xlsx as provided by G. Manorek to K. Skadberg (3/21/11).
3 Fresno County data south of Clinton taken from Fresno road crossing from Clinton to SR 41_jm edit.xlsx as provided by V. Chio to K. Skadberg (4/5/11).
4 Madera and Merced County data taken from RoadwayProjects_091510_combined.xlsx as provided by D. Ayele to K. Skadberg (3/23/11).
5 Did not consider the BNSF MC-01, MC-02, or MC-03 projects as the Merced County projects captured within the A1-Ave21 Wye option is much longer.
6 The data marked as being from the Coordination Meeting was provided via e-mail by G. Manorek to K. Skadberg (4/5/11).
7 Conservatively included impacts from both the Tulare St (overpass option) and Tulare St (underpass option) although only one modification will be conducted.

A.9 BNSF Ave 24: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace	Included in Regional Transportation Plan	Roadway Realignment Length		Structure Length		Data Tab
	R, N, G, Replace	(Y/N)	FT	Miles	FT	Miles	
Fresno County							
SR 99	R	Y	12,400	2.35			Fresno County
Motel Dr (South of Clinton)	R	N	1,700	0.32			Fresno County
Connection from Motel Dr to NB Offramp	R	N	1,000	0.19			Fresno County
SB offramp to Motel Dr (Clinton area)	R	N	1,500	0.28			Fresno County
SB onramp from Clinton	N	N	1,700	0.32			Fresno County
Clinton Ave	Replace	N	2,500	0.47	725	0.14	Fresno County
Pleasant Ave to Woodson Ave	N	N	1,000	0.19			Fresno County
Woodson Ave	R	N	1,000	0.19			Fresno County
Valentine Ave to Dakota Ave	R	N	1,400	0.27			Fresno County
SB offramp to Motel Dr (Ashlan area)	R	N	1,300	0.25			Fresno County
NB offramp to Motel Dr (Ashlan area)	R	N	1,000	0.19			Fresno County
Motel Dr (Ashlan area)	R	N	2,100	0.40			Fresno County
Ashlan Ave	R	N	2,200	0.42	550	0.10	Fresno County
Motel Dr (North of Ashlan)	R	N	23,800	4.51			Fresno County
SB offramp from Golden State Blvd (North of Herndon)	R	N	500	0.09			Fresno County
NB onramp to Golden State Blvd (North of Herndon)	R	N	2,500	0.47			Fresno County
Shaw Ave	G	Y	3,100	0.59	650	0.12	Fresno County
Cornelia	Replace	N	3,600	0.68			Fresno County
Clinton Ave		N					F4
North Golden State Blvd	R	N	4,500	0.85			F4
W McKinley Ave	G	N			375	0.07	F4
Connector between W McKinley Ave and N Golden State Blvd	R	N	650	0.12			F4
N Weber Ave	R	N	360	0.07			F4
N West Ave	R	N	500	0.09			F4
W Olive Ave	G	N			625	0.12	F4
Belmont Ave	G	N			630	0.12	F4
H Street/N Weber Ave	R	N	1,200	0.23			F4
N Wesley Ave	R	N	470	0.09			F4
Neilson Ave	R	N	300	0.06			F4
Stainislaus St	G	N			780	0.15	F4
Tuolumne St	G	N			780	0.15	F4
Fresno St	G	N					F4
G Street at Fresno Street	G	N			160	0.03	F4
Tulare St (overpass option)	G	N			780	0.15	F4
Tulare St (underpass option)	G	N					F4
G Street at Tulare St (underpass option only)	G	N			160	0.03	
Ventura St	G	N			830	0.16	F4
Golden State Blvd Ramps		N					F4
SR41		N					F4
Bullard Ave	N	Y	3,200	0.61			Coordination Meeting
Veterans Blvd	N	Y	2,550	0.48	450	0.09	Coordination Meeting
Golden State Blvd	R	Y	2,500	0.47			Coordination Meeting
Total Feet			**80,530**	**15.25**	**7,495**	**1.42**	
Total Number of Overpasses	**12**						
Structures (< 1 Mile)	**13**	**2 RTP-related**					
Roadways < 1 Mile	**26**	**4 RTP-related**					
Roadways < 2.5 Miles	**1**	**1 RTP-related**					
Roadways > 2.5 Miles	**1**						
Madera County							
Hemlock Road	G	N			300	0.06	BNSF (A1-Ave24 Wye)
Road 10	G	N			330	0.06	BNSF (A1-Ave24 Wye)
Road 13	G	N			220	0.04	BNSF (A1-Ave24 Wye)
Road 14	G	N			215	0.04	BNSF (A1-Ave24 Wye)
Roberts Blvd	G	N			240	0.05	BNSF (A1-Ave24 Wye)
Road 15	G	N			415	0.08	BNSF (A1-Ave24 Wye)
Road 16	G	N			440	0.08	BNSF (A1-Ave24 Wye)
Road 21	G	N			285	0.05	BNSF (A1-Ave24 Wye)
Ave 24	G	N			590	0.11	BNSF (A1-Ave24 Wye)
Access Road N of Ave 23 1/2	R	N	7,850	1.49			BNSF (A1-Ave24 Wye)
Ave 23 1/2	G	N			445	0.08	BNSF (A1-Ave24 Wye)
Road 22	G	N			240	0.05	BNSF (A1-Ave24 Wye)
Road 24	G	N			290	0.05	BNSF (A1-Ave24 Wye)
Ave 20 1/2	G	N			225	0.04	BNSF (A1-Ave24 Wye)
Ave 20	G	N			255	0.05	BNSF (A1-Ave24 Wye)
Ave 26	G	N			490	0.09	BNSF (A1-Ave24 Wye)
Road 22		N	5,400	1.02			BNSF (A1-Ave24 Wye)
Ave 24	G	N					BNSF (A1-Ave24 Wye)
Access Road North of Ave 24		N	3,450	0.65			BNSF (A1-Ave24 Wye)
Road 24	G	N			550	0.10	BNSF (A1-Ave24 Wye)
Access west of Road 24	R	N	7,000	1.33			BNSF (A1-Ave24 Wye)
Ave 20.5	G	N			540	0.10	BNSF (A1-Ave24 Wye)
Frontage Road between Ave 21 and 20 1/2	R	N	4,110	0.78			BNSF (A1-Ave24 Wye)
Road 26	G	N					BNSF (A1-Ave24 Wye)
Hanover Dr parallel to tracks	R	N	2,195	0.42			BNSF (A1-Ave24 Wye)
Lake St	G	N					BNSF (A1-Ave24 Wye)
Ave 17	G	N			460	0.09	BNSF (A1-Ave24 Wye)
Raymond Rd	G	N			325		BNSF (A1-Ave24 Wye)
SR 145	G	N					BNSF (A1-Ave24 Wye)
Road 29 Ave 15 1/2	G	N			595	0.11	BNSF (A1-Ave24 Wye)
Access Road 29	R	N	1,450	0.27			BNSF (A1-Ave24 Wye)
Access Road	R	N	1,000	0.19			BNSF (A1-Ave24 Wye)

A.9 BNSF Ave 24: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace	Included in Regional Transportation Plan	Roadway Realignment Length		Structure Length		Data Tab
	R, N, G, Replace	(Y/N)	FT	Miles	FT	Miles	
Ave 15	G	N			465	0.09	BNSF (A1-Ave24 Wye)
Ave 13	G	N			620	0.12	BNSF (A1-Ave24 Wye)
Road South of Ave 13	G	N	5,150	0.98			BNSF (A1-Ave24 Wye)
Ave 12	G	N			230	0.04	BNSF (A1-Ave24 Wye)
Ave 11	G	N			220	0.04	BNSF (A1-Ave24 Wye)
Ave 10	G	N			250	0.05	BNSF (A1-Ave24 Wye)
Ave 9	G	N			250	0.05	BNSF (A1-Ave24 Wye)
Ave 8	G	N			650	0.12	BNSF (A1-Ave24 Wye)
Road 33	R	N	3,000	0.57			BNSF (A1-Ave24 Wye)
Total Feet			**40,605**	**7.69**	**10,135**	**1.86**	
Total Number of Overpasses	**32**						
Structures (< 1 Mile)	**26**						
Roadways < 1 Mile	**7**						
Roadways < 2.5 Miles	**3**						
Roadways > 2.5 Miles	**0**						
Merced County							
Healy	R	N	2,034	0.39			BNSF (A1-Ave24 Wye)
S. Aboleda Dr	G	N			215	0.05	BNSF (A1-Ave24 Wye)
Plainsburg Rd	G	N			260	0.04	BNSF (A1-Ave24 Wye)
Mariposa Way	G	N			285	0.05	BNSF (A1-Ave24 Wye)
Burchell Av	G	N			530	0.05	BNSF (A1-Ave24 Wye)
Frontage Road West of Burchell	R	N	636	0.12			BNSF (A1-Ave24 Wye)
N. Side Santa Fe Dr La Grand to Ipsen Rd	R	N	3,300	0.63			BNSF (A1-Ave24 Wye)
S. Side Santa Fe Dr. La Grand to Marguerite Rd	R	N	20,565	3.89			BNSF (A1-Ave24 Wye)
Buchanan Hollow Rd	G	N			530	0.10	BNSF (A1-Ave24 Wye)
Santa Fe Dr	G	N			375	0.07	BNSF (A1-Ave24 Wye)
Total Feet			**26,535**	**5.03**	**2,195**	**0.36**	
Number of Overpasses	**6**						
Structures (< 1 Mile)	**6**						
Roadways < 1 Mile	**3**						
Roadways < 2.5 Miles	**0**						
Roadways > 2.5 Miles	**1**						

Notes:
1 Did not consider any alternative design options.
2 Fresno County data north of Clinton taken from Fresno_Crossing_Data.xlsx as provided by G. Manorek to K. Skadberg (3/21/11).
3 Fresno County data south of Clinton taken from Fresno road crossing from Clinton to SR 41_jm edit.xlsx as provided by V. Chio to K. Skadberg (4/5/11).
4 Madera and Merced County data taken from RoadwayProjects_091510_combined.xlsx as provided by D. Ayele to K. Skadberg (3/23/11).
5 Did not consider the BNSF MC-01, MC-02, or MC-03 projects as the Merced County projects captured within the A1-Ave24 Wye option is much longer.
6 The data marked as being from the Coordination Meeting was provided via e-mail by G. Manorek to K. Skadberg (4/5/11).
7 Conservatively included impacts from both the Tulare St (overpass option) and Tulare St (underpass option) although only one modification will be conducted.

A.10 UPRR Ave 21: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace	Included in Regional Transportation Plan	Roadway Realignment Length		Structure Length		Data Tab
	R, N, G, Replace	(Y/N)	FT	Miles	FT	Miles	
Fresno County							
SR 99	R	Y	12,400	2.35			Fresno County
Motel Dr (South of Clinton)	R	N	1,700	0.32			Fresno County
Connection from Motel Dr to NB Offramp	R	N	1,000	0.19			Fresno County
SB offramp to Motel Dr (Clinton area)	R	N	1,500	0.28			Fresno County
SB onramp from Clinton	N	N	1,700	0.32			Fresno County
Clinton Ave	Replace	N	2,500	0.47	725	0.14	Fresno County
Pleasant Ave to Woodson Ave	N	N	1,000	0.19			Fresno County
Woodson Ave	R	N	1,000	0.19			Fresno County
Valentine Ave to Dakota Ave	R	N	1,400	0.27			Fresno County
SB offramp to Motel Dr (Ashlan area)	R	N	1,300	0.25			Fresno County
NB offramp to Motel Dr (Ashlan area)	R	N	1,000	0.19			Fresno County
Motel Dr (Ashlan area)	R	N	2,100	0.40			Fresno County
Ashlan Ave	R	N	2,200	0.42	550	0.10	Fresno County
Motel Dr (North of Ashlan)	R	N	23,800	4.51			Fresno County
SB offramp from Golden State Blvd (North of Herndon)	R	N	500	0.09			Fresno County
NB onramp to Golden State Blvd (North of Herndon)	R	N	2,500	0.47			Fresno County
Shaw Ave	G	Y	3,100	0.59	650	0.12	Fresno County
Cornelia	Replace	N	3,600	0.68			Fresno County
Clinton Ave		N					F4
North Golden State Blvd	R	N	4,500	0.85			F4
W McKinley Ave	G	N			375	0.07	F4
Connector between W McKinley Ave and N Golden State Blvd	R	N	650	0.12			F4
N Weber Ave	R	N	360	0.07			F4
N West Ave	R	N	500	0.09			F4
W Olive Ave	G	N			625	0.12	F4
Belmont Ave	G	N			630	0.12	F4
H Street/N Weber Ave	R	N	1,200	0.23			F4
N Wesley Ave	R	N	470	0.09			F4
Neilson Ave	R	N	300	0.06			F4
Stainislaus St	G	N			780	0.15	F4
Tuolumne St	G	N			780	0.15	F4
Fresno St	G	N					F4
G Street at Fresno Street	G	N			160	0.03	F4
Tulare St (overpass option)	G	N			780	0.15	F4
Tulare St (underpass option)	G	N					F4
G Street at Tulare St (underpass option only)	G	N			160	0.03	
Ventura St	G	N			830	0.16	F4
Golden State Blvd Ramps		N					F4
SR41		N					F4
Bullard Ave	N	Y	3,200	0.61			Coordination Meeting
Veterans Blvd	N	Y	2,550	0.48	450	0.09	Coordination Meeting
Golden State Blvd	R	Y	2,500	0.47			Coordination Meeting
Total Feet			**80,530**	**15.25**	**7,495**	**1.42**	
Total Number of Overpasses	**12**						
Structures (< 1 Mile)	**13**	**2 RTP-related**					
Roadways < 1 Mile	**26**	**4 RTP-related**					
Roadways < 2.5 Miles	**1**	**1 RTP-related**					
Roadways > 2.5 Miles	**1**						
Madera County							
Road 33	R	N	2,635	0.50			A2-Ave21
Realigned Road	R	N	3,594	0.68			A2-Ave21
Avenue 8	G	N			582	0.11	A2-Ave21
Golden State Boulevard	R	N	3,035	0.57			A2-Ave21
Road 31	R	N	1,400	0.27			A2-Ave21
Avenue 9	G	N			737	0.14	A2-Ave21
Avenue 9 (Ramps)		N	4,095	0.78			A2-Ave21
Road 31 1/2	R	N	11,661	2.21			A2-Ave21
Road 30 1/2	R	N	6,939	1.31			A2-Ave21
Road 30	R	N	635	0.12			A2-Ave21
Access Road	R	N	741	0.14			A2-Ave21
Avenue 11	G	N			553	0.10	A2-Ave21
Knox Street	R	N	4,668	0.88			A2-Ave21
E Street	R	N	6,934	1.31			A2-Ave21
Sharon Boulevard	R	N	3,730	0.71			A2-Ave21
Golden State Boulevard	R	N	4,650	0.88			A2-Ave21
Access Road (Underpass to Business area)	R	N	2,292	0.43			A2-Ave21
Avenue 20 & 20 1/2	G	N			602	0.11	A2-Ave21
Avenue 20 & 20 1/2 (Ramps)		N	3,821	0.72			A2-Ave21
Avenue 20 1/2 & Masa Street	R	N	2,385	0.45			A2-Ave21
Fairmead Boulevard	R	N	21,941	4.16			A2-Ave21
North Frontage Road (For futher evaluation during 30%)	R	N	11,514	2.18			A2-Ave21
Road 15 1/2 & Avenue 20 1/2 (For futher evaluation during 30%)	R	N	4,334	0.82			A2-Ave21
Road 16	G	N			443	0.08	A2-Ave21
Road 17 1/2	G	N			607	0.11	A2-Ave21
South Frontage Road	R	N	22,351	4.23			A2-Ave21
South Frontage Road Extension (For further evaluation during 30%)	R	N	6,065	1.15			A2-Ave21
North Frontage Road	R	N	15,307	2.90			A2-Ave21
North Frontage Road Extension (For further evaluation during 30%)	R	N	2,916	0.55			A2-Ave21

A.10 UPRR Ave 21: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace	Included in Regional Transportation Plan	Roadway Realignment Length		Structure Length		Data Tab
	R, N, G, Replace	(Y/N)	FT	Miles	FT	Miles	
Road 19 1/2 (For further evaluation during 30%)	R	N	793	0.15			A2-Ave21
Avenue 21 (For further evaluation during 30%)	R	N	4,595	0.87			A2-Ave21
Road 19	G	N			342	0.06	A2-Ave21
Road 20	G	N			347	0.07	A2-Ave21
Avenue 21 1/2	G	N			223	0.04	A2-Ave21
Avenue 22	G	N			262	0.05	A2-Ave21
Road 18 1/2	R	N	2,471	0.47			A2-Ave21
Total Feet			**155,502**	**29.45**	**4,698**	**0.89**	
Total Number of Overpasses	**10**						
Structures (< 1 Mile)	**10**						
Roadways < 1 Mile	**18**						
Roadways < 2.5 Miles	**5**						
Roadways > 2.5 Miles	**3**						
Merced County							
West Frontage Road	R	N	42,044	7.96	778	0.15	A2-Ave21
Le Grand Road IC	G	Y			615	0.12	A2-Ave21
Le Grand Road IC (Ramps)		Y	2,800	0.53			A2-Ave21
Sandy Mush Road IC	G	Y			519	0.10	A2-Ave21
Sandy Mush Road IC (Ramps)		Y	740	0.14			A2-Ave21
Total Feet			**45,584**	**8.63**	**1,912**	**0.36**	
Number of Overpasses	**2**						
Structures (< 1 Mile)	**3**	**2 RTP-related**					
Roadways < 1 Mile	**2**	**2 RTP-related**					
Roadways < 2.5 Miles	**0**						
Roadways > 2.5 Miles	**1**						

Notes:
1 Did not consider any alternative design options.
2 Fresno County data north of Clinton taken from Fresno_Crossing_Data.xlsx as provided by G. Manorek to K. Skadberg (3/21/11).
3 Fresno County data south of Clinton taken from Fresno road crossing from Clinton to SR 41_jm edit.xlsx as provided by V. Chio to K. Skadberg (4/5/11).
4 Madera and Merced County data taken from RoadwayProjects_091510_combined.xlsx as provided by D. Ayele to K. Skadberg (3/23/11).
5 The data marked as being from the Coordination Meeting was provided via e-mail by G. Manorek to K. Skadberg (4/5/11).
6 Conservatively included impacts from both the Tulare St (overpass option) and Tulare St (underpass option) although only one modification will be conducted.

A.11 UPRR Ave 24: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace R, N, G, Replace	Included in Regional Transportation Plan (Y/N)	Roadway Realignment Length FT	 Miles	Structure Length FT	 Miles	Data Tab
Fresno County							
SR 99	R	Y	12,400	2.35			Fresno County
Motel Dr (South of Clinton)	R	N	1,700	0.32			Fresno County
Connection from Motel Dr to NB Offramp	R	N	1,000	0.19			Fresno County
SB offramp to Motel Dr (Clinton area)	R	N	1,500	0.28			Fresno County
SB onramp from Clinton	N	N	1,700	0.32			Fresno County
Clinton Ave	Replace	N	2,500	0.47	725	0.14	Fresno County
Pleasant Ave to Woodson Ave	N	N	1,000	0.19			Fresno County
Woodson Ave	R	N	1,000	0.19			Fresno County
Valentine Ave to Dakota Ave	R	N	1,400	0.27			Fresno County
SB offramp to Motel Dr (Ashlan area)	R	N	1,300	0.25			Fresno County
NB offramp to Motel Dr (Ashlan area)	R	N	1,000	0.19			Fresno County
Motel Dr (Ashlan area)	R	N	2,100	0.40			Fresno County
Ashlan Ave	R	N	2,200	0.42	550	0.10	Fresno County
Motel Dr (North of Ashlan)	R	N	23,800	4.51			Fresno County
SB offramp from Golden State Blvd (North of Herndon)	R	N	500	0.09			Fresno County
NB onramp to Golden State Blvd (North of Herndon)	R	N	2,500	0.47			Fresno County
Shaw Ave	G	Y	3,100	0.59	650	0.12	Fresno County
Cornelia	Replace	N	3,600	0.68			Fresno County
Clinton Ave		N					F4
North Golden State Blvd	R	N	4,500	0.85			F4
W McKinley Ave	G	N			375	0.07	F4
Connector between W McKinley Ave and N Golden State Blvd	R	N	650	0.12			F4
N Weber Ave	R	N	360	0.07			F4
N West Ave	R	N	500	0.09			F4
W Olive Ave	G	N			625	0.12	F4
Belmont Ave	G	N			630	0.12	F4
H Street/N Weber Ave	R	N	1,200	0.23			F4
N Wesley Ave	R	N	470	0.09			F4
Neilson Ave	R	N	300	0.06			F4
Stainislaus St	G	N			780	0.15	F4
Tuolumne St	G	N			780	0.15	F4
Fresno St	G	N					F4
G Street at Fresno Street	G	N			160	0.03	F4
Tulare St (overpass option)	G	N			780	0.15	F4
Tulare St (underpass option)	G	N					F4
G Street at Tulare St (underpass option only)	G	N			160	0.03	
Ventura St	G	N			830	0.16	F4
Golden State Blvd Ramps		N					F4
SR41		N					F4
Bullard Ave	N	Y	3,200	0.61			Coordination Meeting
Veterans Blvd	N	Y	2,550	0.48	450	0.09	Coordination Meeting
Golden State Blvd	R	Y	2,500	0.47			Coordination Meeting
Total Feet			**80,530**	**15.25**	**7,495**	**1.42**	
Total Number of Overpasses	**12**						
Structures (< 1 Mile)	**13**	**2 RTP-related**					
Roadways < 1 Mile	**26**	**4 RTP-related**					
Roadways < 2.5 Miles	**1**	**1 RTP-related**					
Roadways > 2.5 Miles	**1**						
Madera County							
Road 33	R	N	2,635	0.50			A2-Ave24
Realigned Road	R	N	3,594	0.68			A2-Ave24
Avenue 8	G	N			582	0.11	A2-Ave24
Golden State Boulevard	R	N	3,035	0.57			A2-Ave24
Road 31	R	N	1,400	0.27			A2-Ave24
Avenue 9	G	N			737	0.14	A2-Ave24
Avenue 9 (Ramps)		N	4,095	0.78			A2-Ave24
Road 31 1/2	R	N	11,661	2.21			A2-Ave24
Road 30 1/2	R	N	6,939	1.31			A2-Ave24
Road 30	R	N	635	0.12			A2-Ave24
Access Road	R	N	741	0.14			A2-Ave24
Avenue 11	G	N			553	0.10	A2-Ave24
Knox Street	R	N	4,668	0.88			A2-Ave24
E Street	R	N	6,934	1.31			A2-Ave24
Sharon Boulevard	R	N	3,730	0.71			A2-Ave24
Fairmead Boulevard	R	N	21,890	4.15			A2-Ave24
Avenue 24	R	N	4,186	0.79			A2-Ave24
Avenue 24 (For further evaluation during 30%)	R	N	2,817	0.53			A2-Ave24
North Frontage Road	R	N	9,432	1.79	295	0.06	A2-Ave24
North Frontage Road Extension (For further evaluation during 30%)	R	N	9,149	1.73			A2-Ave24
South Frontage Road	R	N	13,300	2.52			A2-Ave24
South Frontage Road Extension (For further evaluation during 30%)	R	N	30,093	5.70	802	0.15	A2-Ave24
Road 9	G	N			398	0.08	A2-Ave24
Road 13	G	N			441	0.08	A2-Ave24
SR 233 (Robertson Boulevard)	G	N			397	0.08	A2-Ave24
Road 15	G	N			344	0.07	A2-Ave24
Road 16	G	N			286	0.05	A2-Ave24
Avenue 23 1/2	G	N			497	0.09	A2-Ave24
Avenue 24 3/4	R	N	2,276	0.43			A2-Ave24
Road 12 1/2	R	N	10,094	1.91	445	0.08	A2-Ave24

A.11 UPRR Ave 24: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace	Included in Regional Transportation Plan	Roadway Realignment Length		Structure Length		Data Tab
	R, N, G, Replace	(Y/N)	FT	Miles	FT	Miles	
Avenue 26 1/2	R	N	2,706	0.51			A2-Ave24
Avenue 25	G	N			251	0.05	A2-Ave24
Avenue 26	G	N			180	0.03	A2-Ave24
Total Feet			**156,010**	**29.55**	**6,208**	**1.18**	
Total Number of Overpasses	**11**						
Structures (< 1 Mile)	**14**						
Roadways < 1 Mile	**13**						
Roadways < 2.5 Miles	**6**						
Roadways > 2.5 Miles	**3**						
Merced County							
West Frontage Road	R	N	40,280	7.63	778	0.15	A2-Ave24
Road 12	R	N	6,957	1.32	282	0.05	A2-Ave24
Le Grand Road IC	G	Y			615	0.12	A2-Ave24
Le Grand Road IC (Ramps)		Y	2,800	0.53			A2-Ave24
Sandy Mush Road IC	G	Y			579	0.11	A2-Ave24
Sandy Mush Road IC (Ramps)		Y	740	0.14			A2-Ave24
Cross Road	G	N			180	0.03	A2-Ave24
Total Feet			**50,777**	**9.62**	**2,434**	**0.46**	
Number of Overpasses	**3**						
Structures (< 1 Mile)	**5**	**2 RTP-related**					
Roadways < 1 Mile	**2**	**2 RTP-related**					
Roadways < 2.5 Miles	**1**						
Roadways > 2.5 Miles	**1**						

Notes:
1 Did not consider any alternative design options.
2 Fresno County data north of Clinton taken from Fresno_Crossing_Data.xlsx as provided by G. Manorek to K. Skadberg (3/21/11).
3 Fresno County data south of Clinton taken from Fresno road crossing from Clinton to SR 41_jm edit.xlsx as provided by V. Chio to K. Skadberg (4/5/11).
4 Madera and Merced County data taken from RoadwayProjects_091510_combined.xlsx as provided by D. Ayele to K. Skadberg (3/23/11).
5 Did not consider the A2-W. Chowchilla option as that Ave 24 option is much shorter than the E. Chowchilla option.
6 The data marked as being from the Coordination Meeting was provided via e-mail by G. Manorek to K. Skadberg (4/5/11).
7 Conservatively included impacts from both the Tulare St (overpass option) and Tulare St (underpass option) although only one modification will be conducted.

A.12 Hybrid Ave 24: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace R, N, G, Replace	Included in Regional Transportation Plan (Y/N)	Roadway Realignment Length FT	 Miles	Structure Length FT	 Miles	Associated Alternative
Fresno County							
SR 99	R	Y	12,400	2.35			Fresno County
Motel Dr (South of Clinton)	R	N	1,700	0.32			Fresno County
Connection from Motel Dr to NB Offramp	R	N	1,000	0.19			Fresno County
SB offramp to Motel Dr (Clinton area)	R	N	1,500	0.28			Fresno County
SB onramp from Clinton	N	N	1,700	0.32			Fresno County
Clinton Ave	Replace	N	2,500	0.47	725	0.14	Fresno County
Pleasant Ave to Woodson Ave	N	N	1,000	0.19			Fresno County
Woodson Ave	R	N	1,000	0.19			Fresno County
Valentine Ave to Dakota Ave	R	N	1,400	0.27			Fresno County
SB offramp to Motel Dr (Ashlan area)	R	N	1,300	0.25			Fresno County
NB offramp to Motel Dr (Ashlan area)	R	N	1,000	0.19			Fresno County
Motel Dr (Ashlan area)	R	N	2,100	0.40			Fresno County
Ashlan Ave	R	N	2,200	0.42	550	0.10	Fresno County
Motel Dr (North of Ashlan)	R	N	23,800	4.51			Fresno County
SB offramp from Golden State Blvd (North of Herndon)	R	N	500	0.09			Fresno County
NB onramp to Golden State Blvd (North of Herndon)	R	N	2,500	0.47			Fresno County
Shaw Ave	G	Y	3,100	0.59	650	0.12	Fresno County
Cornelia	Replace	N	3,600	0.68			Fresno County
Clinton Ave		N					F4
North Golden State Blvd	R	N	4,500	0.85			F4
W McKinley Ave	G	N			375	0.07	F4
Connector between W McKinley Ave and N Golden State Blvd	R	N	650	0.12			F4
N Weber Ave	R	N	360	0.07			F4
N West Ave	R	N	500	0.09			F4
W Olive Ave	G	N			625	0.12	F4
Belmont Ave	G	N			630	0.12	F4
H Street/N Weber Ave	R	N	1,200	0.23			F4
N Wesley Ave	R	N	470	0.09			F4
Neilson Ave	R	N	300	0.06			F4
Stainislaus St	G	N			780	0.15	F4
Tuolumne St	G	N			780	0.15	F4
Fresno St	G	N					F4
G Street at Fresno Street	G	N			160	0.03	F4
Tulare St (overpass option)	G	N			780	0.15	F4
Tulare St (underpass option)	G	N					F4
G Street at Tulare St (underpass option only)	G	N			160	0.03	
Ventura St	G	N			830	0.16	F4
Golden State Blvd Ramps		N					F4
SR41		N					F4
Bullard Ave	N	Y	3,200	0.61			Coordination Meeting
Veterans Blvd	N	Y	2,550	0.48	450	0.09	Coordination Meeting
Golden State Blvd	R	Y	2,500	0.47			Coordination Meeting
Total Feet			**80,530**	**15.25**	**7,495**	**1.42**	
Total Number of Overpasses	**12**						
Structures (< 1 Mile)	**13**	**2 RTP-related**					
Roadways < 1 Mile	**26**	**4 RTP-related**					
Roadways < 2.5 Miles	**1**	**1 RTP-related**					
Roadways > 2.5 Miles	**1**						
Madera County							
Hemlock Road	G	N			300	0.06	BNSF (Hybrid)
Road 10	G	N			330	0.06	BNSF (Hybrid)
Road 13	G	N			220	0.04	BNSF (Hybrid)
Road 14	G	N			215	0.04	BNSF (Hybrid)
Roberts Blvd	G	N			240	0.05	BNSF (Hybrid)
Road 15	G	N			415	0.08	BNSF (Hybrid)
Road 16	G	N			440	0.08	BNSF (Hybrid)
Ave 23 1/2	G	N			445	0.08	BNSF (Hybrid)
Road 22	G	N			240	0.05	BNSF (Hybrid)
Road 24	G	N			290	0.05	BNSF (Hybrid)
Ave 20 1/2	G	N			225	0.04	BNSF (Hybrid)
Ave 20	G	N			255	0.05	BNSF (Hybrid)
Road 26	G	N					BNSF (Hybrid)
Hanover Dr parallel to tracks	R	N	2,195	0.42			BNSF (Hybrid)
Lake St	G	N					BNSF (Hybrid)
Ave 17	G	N			460	0.09	BNSF (Hybrid)
Raymond Rd	G	N			325	0.06	BNSF (Hybrid)
SR 145	G	N					BNSF (Hybrid)
Road 29 Ave 15 1/2	G	N			595	0.11	BNSF (Hybrid)
Access Road 29	R	N	1,450	0.27			BNSF (Hybrid)
Access Road	R	N	1,000	0.19			BNSF (Hybrid)
Ave 15	G	N			465	0.09	BNSF (Hybrid)
Ave 13	G	N			620	0.12	BNSF (Hybrid)
Road South of Ave 13	G	N	5,150	0.98			BNSF (Hybrid)
Ave 12	G	N			230	0.04	BNSF (Hybrid)
Ave 11	G	N			220	0.04	BNSF (Hybrid)
Ave 10	G	N			250	0.05	BNSF (Hybrid)
Ave 9	G	N			250	0.05	BNSF (Hybrid)
Ave 8	G	N			650	0.12	BNSF (Hybrid)
Road 33	R	N	3,000	0.57			BNSF (Hybrid)
Avenue 24	R	N	4,186	0.79			A2-Hybrid
Road 10	G	N			365	0.07	A2-Hybrid

A.12 Hybrid Ave 24: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace	Included in Regional Transportation Plan	Roadway Realignment Length		Structure Length		Associated Alternative
	R, N, G, Replace	(Y/N)	FT	Miles	FT	Miles	
Road 13	G	N			627	0.12	A2-Hybrid
SR 233 (Robertson Boulevard)	G	N			343	0.06	A2-Hybrid
Connector Road 1	R	N	1,516	0.29			A2-Hybrid
Avenue 25	G	N			1,223	0.23	A2-Hybrid
Connector Road 2	R	N	1,048	0.20			A2-Hybrid
Avenue 26	G	N			669	0.13	A2-Hybrid
Total Feet			**19,545**	**3.70**	**10,907**	**2.07**	
Total Number of Overpasses	**31**						
Structures (< 1 Mile)	**27**						
Roadways < 1 Mile	**8**						
Roadways < 2.5 Miles	**0**						
Roadways > 2.5 Miles	**0**						
Merced County							
West Frontage Road	R	N	4,327	0.82			A2-Hybrid
West Frontage Road (For futher evaluation during 30%)	R	N	39,850	7.55	806	0.15	A2-Hybrid
Le Grand Road IC	G	Y			436	0.08	A2-Hybrid
Sandy Mush Road IC	G	Y			212	0.04	A2-Hybrid
Sandy Mush Road	R	Y	1,200	0.23			A2-Hybrid
Road 11	R	N	8,172	1.55	200	0.04	A2-Hybrid
Cross Road	G	N			219	0.04	A2-Hybrid
Cross Road	R	N	2,000	0.38			A2-Hybrid
Total Feet			**55,549**	**10.52**	**1,873**	**0.35**	
Number of Overpasses	**3**						
Structures (< 1 Mile)	**5**	**2 RTP-related**					
Roadways < 1 Mile	**3**	**1 RTP-related**					
Roadways < 2.5 Miles	**1**						
Roadways > 2.5 Miles	**1**						

Notes:
1 Did not consider any alternative design options.
2 Fresno County data north of Clinton taken from Fresno_Crossing_Data.xlsx as provided by G. Manorek to K. Skadberg (3/21/11).
3 Fresno County data south of Clinton taken from Fresno road crossing from Clinton to SR 41_jm edit.xlsx as provided by V. Chio to K. Skadberg (4/5/11).
4 Madera and Merced County data taken from RoadwayProjects_091510_combined.xlsx as provided by D. Ayele to K. Skadberg (3/23/11).
5 The data marked as being from the Coordination Meeting was provided via e-mail by G. Manorek to K. Skadberg (4/5/11).
6 Conservatively included impacts from both the Tulare St (overpass option) and Tulare St (underpass option) although only one modification will be conducted.

A.13 Hybrid Ave 21: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace R, N, G, Replace	Included in Regional Transportation Plan (Y/N)	Roadway Realignment Length FT	 Miles	Structure Length FT	 Miles	Associated Alternative
Fresno County							
SR 99	R	Y	12,400	2.35			Hybrid Ave 21
Motel Dr (South of Clinton)	R	N	1,700	0.32			Hybrid Ave 21
Connection from Motel Dr to NB Offramp	R	N	1,000	0.19			Hybrid Ave 21
SB offramp to Motel Dr (Clinton area)	R	N	1,500	0.28			Hybrid Ave 21
SB onramp from Clinton	N	N	1,700	0.32			Hybrid Ave 21
Clinton Ave	Replace	N	2,500	0.47	725	0.14	Hybrid Ave 21
Pleasant Ave to Woodson Ave	N	N	1,000	0.19			Hybrid Ave 21
Woodson Ave	R	N	1,000	0.19			Hybrid Ave 21
Valentine Ave to Dakota Ave	R	N	1,400	0.27			Hybrid Ave 21
SB offramp to Motel Dr (Clinton area)	R	N	1,500	0.28			Hybrid Ave 21
SB onramp from Clinton	N	N	1,700	0.32			Hybrid Ave 21
Clinton Ave	Replace	N	2,500	0.47	725	0.14	Hybrid Ave 21
Pleasant Ave to Woodson Ave	N	N	1,000	0.19			Hybrid Ave 21
Woodson Ave	R	N	1,000	0.19			Hybrid Ave 21
Valentine Ave to Dakota Ave	R	N	1,400	0.27			Hybrid Ave 21
SB offramp to Motel Dr (Ashlan area)	R	N	1,300	0.25			Hybrid Ave 21
NB offramp to Motel Dr (Ashlan area)	R	N	1,000	0.19			Hybrid Ave 21
Motel Dr (Ashlan area)	R	N	2,100	0.40			Hybrid Ave 21
Ashlan Ave	R	N	2200	0.42	550	0.10	Hybrid Ave 21
Motel Dr (North of Ashlan)	R	N	23,800	4.51			Hybrid Ave 21
SB offramp from Golden State Blvd (North of Herndon)	R	N	500	0.09			Hybrid Ave 21
NB onramp to Golden State Blvd (North of Herndon)	R	N	2,500	0.47			Hybrid Ave 21
Shaw Ave	G	Y	3,100	0.59	650	0.12	Hybrid Ave 21
Cornelia	Replace	N	3,600	0.68			Hybrid Ave 21
Clinton Ave		N					Hybrid Ave 21
North Golden State Blvd	R	N	4,500	0.85			Hybrid Ave 21
W McKinley Ave	G	N			375	0.07	Hybrid Ave 21
Connector between W McKinley Ave and N Golden State Blvd	R	N	650	0.12			Hybrid Ave 21
N Weber Ave	R	N	360	0.07			Hybrid Ave 21
N West Ave	R	N	500	0.09			Hybrid Ave 21
W Olive Ave	G	N			625	0.12	Hybrid Ave 21
Belmont Ave	G	N			630	0.12	Hybrid Ave 21
H Street/N Weber Ave	R	N	1,200	0.23			Hybrid Ave 21
N Wesley Ave	R	N	470	0.09			Hybrid Ave 21
Neilson Ave	R	N	300	0.06			Hybrid Ave 21
Stainislaus St	G	N			780	0.15	Hybrid Ave 21
Tuolumne St	G	N			780	0.15	Hybrid Ave 21
Fresno St	G	N					Hybrid Ave 21
G Street at Fresno Street	G	N			160	0.03	Hybrid Ave 21
Tulare St (overpass option)	G	N			780	0.15	Hybrid Ave 21
Tulare St (underpass option)	G	N					Hybrid Ave 21
G Street at Tulare St (underpass option only)	G	N			160	0.03	Hybrid Ave 21
Ventura St	G	N			830	0.16	Hybrid Ave 21
Golden State Blvd Ramps		N					Hybrid Ave 21
SR41		N					Hybrid Ave 21
Bullard Ave	N	Y	3,200	0.61			Hybrid Ave 21
Veterans Blvd	N	Y	2,550	0.48	450	0.09	Hybrid Ave 21
Golden State Blvd	R	Y	2,500	0.47			Hybrid Ave 21
Total Feet			**89,630**	**16.98**	**8,220**	**1.56**	
Total Number of Overpasses	**12**						
Structures (< 1 Mile)	**14**	**2 RTP-related**					
Roadways < 1 Mile	**32**	**4 RTP-related**					
Roadways < 2.5 Miles	**1**	**1 RTP-related**					
Roadways > 2.5 Miles	**1**						
Madera County							
Road 22	G	N			452	0.09	Hybrid Ave 21
Access Road West of Road 22	R	N	2,301	0.44			Hybrid Ave 21
Access Road between Ave 21 and Road 20	R	N	5,841	1.11			Hybrid Ave 21
Ave 20 1/2	G	N			300	0.06	Hybrid Ave 21
Access Road South of Ave 20 1/2	R	N	2,679	0.51			Hybrid Ave 21
Access Road North of Ave 20 1/2	R	N	1,775	0.34			Hybrid Ave 21
Hanover Dr parallel to tracks	R	N	2,195	0.42			Hybrid Ave 21
Lake St	G	N					Hybrid Ave 21
Ave 17	G	N			460	0.09	Hybrid Ave 21
Raymond Rd	G	N			325	0.06	Hybrid Ave 21
SR 145	G	N					Hybrid Ave 21
Road 29 Ave 15 1/2	G	N			595	0.11	Hybrid Ave 21
Access Road 29	R	N	1,450	0.27			Hybrid Ave 21
Access Road	R	N	1,000	0.19			Hybrid Ave 21
Ave 15	G	N			465	0.09	Hybrid Ave 21
Ave 13	G	N			620	0.12	Hybrid Ave 21
Road South of Ave 13	G	N	5,150	0.98			Hybrid Ave 21
Ave 12	G	N			230	0.04	Hybrid Ave 21
Ave 11	G	N			220	0.04	Hybrid Ave 21
Ave 10	G	N			250	0.05	Hybrid Ave 21
Ave 9	G	N			250	0.05	Hybrid Ave 21
Ave 8	G	N			650	0.12	Hybrid Ave 21
Road 33	R	N	3,000	0.57			Hybrid Ave 21
Avenue 24	R	N	4,186	0.79			Hybrid Ave 21
Road 10	G	N			365	0.07	Hybrid Ave 21
Road 13	G	N			627	0.12	Hybrid Ave 21
SR 233 (Robertson Boulevard)	G	N			343	0.06	Hybrid Ave 21

A.13 Hybrid Ave 21: Roadway Projects

Road Name	Realign, New, Grade Separation, Replace R, N, G, Replace	Included in Regional Transportation Plan (Y/N)	Roadway Realignment Length		Structure Length		Associated Alternative
			FT	Miles	FT	Miles	
Connector Road 1	R	N	1,516	0.29			Hybrid Ave 21
Avenue 25	G	N			1,223	0.23	Hybrid Ave 21
Connector Road 2	R	N	1,048	0.20			Hybrid Ave 21
Avenue 26	G	N			669	0.13	Hybrid Ave 21
Total Feet			**32,141**	**6.09**	**8,044**	**1.52**	
Total Number of Overpasses	**20**						
Structures (< 1 Mile)	**17**						
Roadways < 1 Mile	**11**						
Roadways < 2.5 Miles	**1**						
Roadways > 2.5 Miles	**0**						
Merced County							
West Frontage Road	R	N	4,327	0.82			Hybrid Ave 21
West Frontage Road (For futher evaluation during 30%)	R	N	39,850	7.55	806	0.15	Hybrid Ave 21
Le Grand Road IC	G	Y			436	0.08	Hybrid Ave 21
Sandy Mush Road IC	G	Y			212	0.04	Hybrid Ave 21
Sandy Mush Road	R	Y	1,200	0.23			Hybrid Ave 21
Road 11	R	N	8,172	1.55	200	0.04	Hybrid Ave 21
Cross Road	G	N			219	0.04	Hybrid Ave 21
Cross Road	R	N	2,000	0.38			Hybrid Ave 21
Total Feet			**55,549**	**10.52**	**1,873**	**0.35**	
Number of Overpasses	**3**						
Structures (< 1 Mile)	**5**	**2 RTP-related**					
Roadways < 1 Mile	**3**	**1 RTP-related**					
Roadways < 2.5 Miles	**1**						
Roadways > 2.5 Miles	**1**						

Notes:
1 Did not consider any alternative design options.
2 Data taken from Roadway_Mods_Hybrid_Ave21.xlsx as provided by K. Skadberg to E. Pieper (6/3/11).
3 Conservatively included impacts from both the Tulare St (overpass option) and Tulare St (underpass option) although only one modification will be conducted.

A.14 Power Supply Stations

Data Taken from Project Descriptions
Data used in calculations

Construction Start Date:	Starts July 2016
Duration of construction for trenches:	assume 1 mile in 1 month

Data per Power Station Location

Station	Duration of Construction	Length (ft)	Width (ft)	Station Footprint (ft^2)	Station Footprint (acres)	25% Station Footprint (acres)	Station Control House (ft^2)	Access Road (w) (ft)	Access Road (l) (ft)	# of New Stations	Components	Assumptions
Traction Power Station	29	200	150	30,000	0.66	0.17	800	20	500	2	2 high voltage utility supply circuits	30 mile intervals along HSR right-of-way (2)
Switching Station	29	120	80	9,600	0.21	0.05	800	No Road	No Road	every 15-miles	4 - 2 x 25kV autotransformers	Located midway between the TP Station (3)
Paralleling Station	29	100	80	8,000	0.18	0.04	800	No Road	No Road	every 7.5 miles	2 - 2 x 25kV autotransformers	located at 5 mile intervals between switching station and the substations (4)

TP: Building Type	Building size (sqft)
Station Structure	2,000
Station Control House	1,250
Total TP Size (sqft)	3,250
Switching Station: Building Type	Building size (sqft)
Station Structure	0
Station Control House	450
Total SS Size (sqft)	450
Paralleling Station: Building Type	Building size (sqft)
Station Structure	0
Station Control House	450
Total PS Size (sqft)	450

Assumptions:

Assume no specific transmission line construction because the resulting construction emissions will be insignificant relative to the total alignment calculations.
TP stations shall be no more than 100 ft from center of CHSR right of way.
Assume that there are 5 miles of 5 feet wide by 10 feet deep trench (assumes 2, 2.5 mile long trench from existing substation to traction power station). This information will be utilized in the alignment construction emission estimates.
Assume that the transformers and switchgear are not constructed onsite.
Buildings are concrete.
Entire station site will be graded.
There will be no demolition activities included in the construction of the power stations.
Access roads will be covered with gravel so no paving required.
Assume no soil imported or exported during the construction activities. All soil hauling will be included as part of the alignment.
The project area for buildings (for grading calculations) will be based on the station footprint.
Assume 5 work days per week (URBEMIS2007 default).
Assume mass site grading rather than fine site grading. Fine site grading is the default.
Use the General Light Industry Land Use Category in URBEMIS2007.
Land Use was based on the total building construction area (Building Sizes).
Assumed the maximum daily acres graded were 25% of the total acres graded (URBEMIS2007 default).
URBEMIS2007 assumes the total acres graded are 2x the building area; overwrote the total acres graded with the actual station footprint.
Programmatic mitigation for fugitive dust included: equipment loading/unloading (trucks hauling loose materials must be covered), replace ground cover in disturbed areas quickly, water exposed surfaces 2x daily, water unpaved access roads 3x daily, and reduce speed on unpaved roads to less than 15 mph.
Mitigation for fugitive dust included: water exposed surfaces 3x daily.
The fugitive dust mitigation measures were applied based on the SJVAPCD Rule 8021; the most stringent watering techniques were applied.
A PM reduction of 69% was applied to the equipment loading/unloading per SCAQMD Guidance (Table XI-A Mitigation Measure Examples: Fugitive Dust from Construction & Demolition).
Exhaust emissions were not controlled in URBEMIS2007 as the default, unmitigated emission factors used by URBEMIS create a fleet-average Tier 2 mix.
Mitigation was applied externally to the exhaust emissions based on the fleet-average Tier mix and the required % reductions to meet Tier 4 standards, based on SCAQMD Table II - Off-Road Engine Emission Rates & Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rates.
Mitigation used for architectural coatings included the use of Low-VOC coatings (providing a 10% reduction in ROG emissions).
Only using the default equipment, load, and hours of operation as provided in URBEMIS2007 for the construction of the power stations.
For Grading, assume default URBEMIS2007 number of workers (125% of # of construction equipment) and no vendors.
For Building construction, assume default URBEMIS2007 number of vendor trips (0.38 trips / 1,000 sqft) and worker trips (0.42 trips / 1,000 sqft).
For Architectural Coatings, assume default URBEMIS2007 number of worker trips (20% of the building construction worker trips) and no vendor trips.
Each station will be modeled individually.
URBEMIS2007 defaults the building construction equipment to 0 for the Paralleling Station and the Switching Station due to their small acreage and short construction phase. URBEMIS2007 defaults were overwritten with the defaults for 1 acre from Appendix H of the URBEMIS2007 User's Guide (1 crane, 2 forklifts, 1 tractor/loader/backhoe).
Assume no operational emissions associated with the power stations.

A.15 Demobilization

Data Used in Calculations

Construction Start Date:	Starts August 2017
Construction Duration (months):	29
Construction Duration (days):	631

Equipment Type	Horsepower	Quantity per Site (Staging Area)	No. of Sites (Staging Areas)	Total Equipment Pieces	Hours per Day	Hours per Year
Flatbed Truck - 1 Ton	175	15	2	30	8	1,683
Flatbed Truck - 5 Ton	210	15	2	30	8	1,683
Flatbed Tractor/Trailer	500	30	2	60	8	1,683
Service Truck - Fuel/Lube	300	5	2	10	8	1,683
Water Truck	210	5	2	10	8	1,683
Light Plant - 4 Lights	10	10	2	20	8	1,683
Truck dump 18 CY Triaxle	200	5	2	10	8	1,683
Boom Truck - 20 Ton	330	5	2	10	8	1,683
CAT 416E Backhoe	87	2	2	4	8	1,683
CAT 330 2.5 CY Excavator	300	1	2	2	8	1,683
CAT D6K Dozer	125	2	2	4	8	1,683

Assumptions:

Assume 5 work days per week (URBEMIS2007 default).

Assume mass site grading rather than fine site grading. Fine site grading is the default.

Assume no material hauling or grading activities associated with demobilization, only equipment operation.

The URBEMIS2007 defaults for the total area graded and maximum daily area disturbed were overwritten with a value of 0.0.

Use a site-specific Land Use Category, similar to the Industrial Park, in URBEMIS2007.

Land Use was based on the total alignment footprint.

Land Use was conservatively set to the footprint of the longest Alternative (BNSF Ave 24) (53,121,779 square feet). See the 'Alignment' tab for details.

Assumed a load factor of 0.65 for all equipment pieces, as recommended by the engineering team of URS.

The hours per year are divided by 3 because the activity happens in 3 different years.

Equipment list provided by A. Tamahne/URS and confirmed by J. Valsecchi/CH2M HILL (3/21/11).

Equipment engines were assumed to be built or rebuilt in the year 2005, based on recommendations provided by the engineering team of URS.

Programmatic mitigation included: water unpaved access roads 3x daily and reduce speed on unpaved roads to less than 15 mph.

A PM reduction of 69% was applied to the equipment loading/unloading per SCAQMD Guidance (Table XI-A Mitigation Measure Examples: Fugitive Dust from Construction & Demolition).

Exhaust emissions were not controlled in URBEMIS2007 as the default, unmitigated emission factors used by URBEMIS2007 create a fleet-average Tier 2 mix.

Mitigation was applied externally to the exhaust emissions based on the fleet-average Tier mix and the required % reductions to meet Tier 4 standards, based on SCAQMD Table II Off-Road Engine Emission Rates & Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rates.

A.16 Maintenance Facilities

Data Taken from Project Descriptions
Data used in calculations

Overnight Layover / Servicing Facility		
Overnight Layover / Servicing Facility	Approximate Size	Notes
Facility Description	Uses four tracks that extend beyond station platforms (occurs at north end beyond station platform); a light maintenance facility	Stores 7- 200 meter long train-sets. Service Facilities including: train washing, wheel inspection, interior train cleaning, pumping out and cleaning of train holding tanks, and restocking commissary supplies.
Construction Start Date	Starts June 2018	Assumed to be the same start date as the Train stations and power stations.
Construction Duration (months)	7	Taken from schedule provided by PMT.
Total Area to be graded and cleared (sqft)	64,304	Based on the width (98 ft) as listed in TM 5.1, pg. 39 and the train length of 200 meters . This area is included in the HMF area listed below and was not modeled separately.
Buildings (sqft)	7,277	Assume light maintenance facility; buildings constructed will be approximately 1% of the total HMF buildings, based on the ratio of total areas cleared.
Activities at Overnight layover / servicing facility	Clean trains that are parked at facility (10 - 20 trains parked at the site).	Provide general description of emission sources located at this facility.
# of Employees (daily)	40	1 shift of employees. Assume same # of employees for 2020.
Area paved (sqft)	57,028	Assume equal to the total area to be graded minus the buildings as a conservative estimate.
Data Assumptions and Inputs are based on: TM 5.1. Assume there is no concrete or asphalt areas in this facility		

Heavy Maintenance Facility		
HMF	Approximate Value	Notes
Facility Description	Test track connected to a heavy maintenance facility	Assembly, testing, acceptance, and commissioning of HST System new rolling stock fleet. Train Assembly/Inspection/Storage. Overhaul Trains/modifications/repair. Service Monitoring. Operations Control Center (assumed located in second story in the HMF building).
Construction Start Date	Starts January 2021	Assumed to be the same start date as the Train stations and power stations.
Construction Duration (months)	7	Taken from schedule provided by PMT.
Total Area to be graded and cleared	154 acres	Heavy Maintenance Facility (2 miles long, 154 acres); approximate size (including roadway and parking).
Storage Tracks	Number of tracks: 24 - Length: 800 meter	150 train sets
Buildings (sqft)	720,399	Total HMF buildings are 727,676 sqft (based on data in TM5.1-A). Assume that the HMF construction is for all buildings not constructed during the Overnight Layover / Servicing Construction.
Amount of Fuel Stored Onsite	40,000 gallons tanks - replaced about once a month	Diesel fuel. Fetch parts, rail swing, rail tenders, generator (mostly mobile sources).
# of Employees	1,500	Revised data provide 1,350 employees split over 2 shifts - use higher value as conservative.
Max # of trucks to visit the site	Approximately 20 truck delivers per day (heavy duty trucks).	This would include equipment / fuel deliveries.
Max # of onsite trucks/equipment	On-site diesel pick-up trucks, flat bed trucks, diesel train mover (700 hp approximately, moves 5-10 miles). Emissions covered by the on-site fuel the vehicles use.	This would include onsite vehicles used by facility staff. No additional emissions from these vehicles.
Area paved (sqft)	5,923,536	Assume equal to the total area to be graded minus the HMF buildings and Overnight Layover / Servicing Facility area as a conservative estimate.
Parking:	Data Value	Notes
"lay down" equipment staging and storage area	35,0000 sqft	Maintenance equipment and the personnel who would operate and maintain the Train Washer and Automatic Wheel Inspection Station.
# Parking Spots Required	1,600	Assume 20% of employees will ride share.

A.16 Maintenance Facilities

Data Taken from Project Descriptions
Data used in calculations

Specialty Operations	Chemicals Used (Type / Quantity) & Activity Details	Shop Description	Notes:
Not activity specific / General Facility			
Lube Oil	20,000 gallons per tank	Generally 2 types of oils in tank (engine lubricants)	Based on standard Amtrak HMF with diesel locomotives (facility typically handles 3 types of locomotives/cars) (JV 05/06/10)
Fuel (diesel)	40,000 gallons tanks - replaced about once a month	2, 20K tanks as well, on-site diesel pick up trucks, flat bed trucks, diesel train mover (700 hp approx) - move 5-10 miles	Based on standard Amtrak HMF with diesel locomotives (facility typically handles 3 types of locomotives/cars) (JV 05/06/10) Revised based on size of tanks stored on site
Activity Specific Chemical / Emission Sources			
Onsite Sewage Treatment Facility	500 gal - amount dumped per day (per train)	Toilet dump wagon ('honey car')	Based on standard Amtrak HMF with diesel locomotives (facility typically handles 3 types of locomotives/cars) (JV 05/06/10)
	Vehicle washer chemicals ~ 5,000 gal /washer (JV, 05/06/10)		However, there has been growing concern over suspect chemicals that contain amounts of phosphorous, ammonia, APE/NPE and petroleum distillate. Regardless of region, three main environmental culprits standout to the carwash industry (1) phosphorous, (2) alkyl phenol ethoxylates (APEs) and (3) petroleum distillates. Assume that detergent used will be CARB compliant: CARB = Complies with California Air Quality Resource Board. Contains less than 0.2% VOC when used at recommended dilution levels. CARB2 = Complies with California Air Quality Resource Board special exemptions for Tire Cleaners, Tar Removers and non-aersol glass cleaners.
Carbody Pretreatment & Painting Shop	Paint ~ 4,000 gal on site (JV, 05/06/10) - over several years	Steel structure repairing shop, washing, brushing, air blowing shop, blasting shop, soft grinding/putty/sticky/masking shop, carbody painting shop, carbody drying shop (daily water washes with detergent, chemical wash ~ monthly intervals Railway Tech (RT), 2010)	Based on standard Amtrak HMF with diesel locomotives (facility typically handles 3 types of locomotives/cars) (JV 05/06/10)
Activities at the HMF (no specific emissions associated with these activities)			
Train Assembly/Inspection/Storage			
Overhaul Trains/modifications/repair			
Service Monitoring			
Operations Control Center			
Bogie Shop (Dummy bogie storage area, bogie storage area, bogie dis/assembly shop, bogie repair shop)			
Heavy Electric Shop (Main Transformer shop, power block shop, pantograph and roof apparatus, Aux. motor shop, traction motor shop)			
Heavy Mechanical shop (Gangway Ring Shop, Coupler/buffer shop, Motor reduction unit and transmission, air spring shop, oil damper shop			
Pneumatic shop (Brake unit shop, air compressor shop, brake panel/dryer shop, door shop)			
Comfort Shop (Sanitary parts Shop, Interior Fittings shop, Seat Shop, Polyester and carpentry shop)			
Wheel set Shop (Wheel set storage area, wheel set Dis/Assembly Shop, bearing laboratory shop)			
Air Conditioning Shop			
Cable/wire shop			
Battery Shop			
Electric / Electronics Shop			
Unitary Test Area			
Common Parts Cleaning shop			
Common Parts Painting Shop			
Automatic Warehouse			
Primary Vehicle Overhaul Area (Assume this area includes the interior cleaning facilities. This includes a 'toilet discharge facility' This will be done away from the main buildings near the sewage treatment facility - formaldehyde will likely be used in the flushing water (RT 2010))			
Data Assumptions and Inputs are based on: Merced to Bakersfield Heavy Maintenance Facility Concept Plan, TM 5.1A, 154 Acres			

Maintenance Facility Stationary Sources:
Assume that we are not going to get any specific data on the type of stationary sources located at the facility. Will indicate that these will be permitted as appropriate, at which time public will have an opportunity to comment

A.16 Maintenance Facilities

Data Taken from Project Descriptions
Data used in calculations

Assumptions for Construction and Operation Emissions:
Assume 5 work days per week (URBEMIS2007 default) for the construction phases.
Assume mass site grading rather than fine site grading. Fine site grading is the default.
Use the General Heavy Industry Land Use Category in URBEMIS2007.
Land Use for Phase I was based on the total building construction area (sum of HMF and Overnight Layover / Servicing Facility Buildings sqft)
Land Use for Phases II and III were based on the building construction areas for each building (Overnight Layover / Servicing Facility for Phase II and HMF for Phase III)
Assumed the maximum daily acres graded were 25% of the total acres graded (URBEMIS2007 default).
URBEMIS2007 assumes the total acres graded are 2x the building area; overwrote the total acres graded with the actual acres of land graded
URBEMIS2007 assumes the total acres paved are 2x the building area; overwrote the total acres paved with the actual acres of paving for each facility
The Overnight Layover / Servicing Facility is co-located with the HMF such that the buildings will be considered separately but are contained within the footprint of the 154 acres graded for the HMF
HMF Phase I Construction includes grading of the entire site (154 acres).

HMF Phase II Construction includes Paving and Building Construction activities for the Overnight Layover / Servicing Facility as well as lying elevated, at-grade, and retained fill rail and constructing elevated structures located at the Overnight Layover / Servicing Facility.
The portion of rail located at the Overnight Layover / Servicing Facility was determined as follows: Overnight Track / Overnight Area Cleared = Total HMF Track / Total HMF Area Cleared.
The Phase II did not include any programmatic mitigation; as a result, only one URBEMIS2007 run was performed. The "unmitigated" results represent the programmatic scenario. Exhaust mitigation was applied externally based on the programmatic scenario URBEMIS2007 results.
HMF Phase III Construction includes Paving, Building Construction, and Architectural Coating activities for the HMF as well as lying elevated, at-grade, and retained fill rail and constructing elevated structures located at the HMF
The portion of rail located at the HMF was determined as follows: HMF Track = Total HMF Track - Overnight Track.
The Phase III did not include any programmatic mitigation; as a result, only one URBEMIS2007 run was performed. The "unmitigated" results represent the programmatic scenario and the "mitigated" results represent the scenario with architectural coating mitigation.
Exhaust mitigation was still applied externally.
Programmatic mitigation for fugitive dust included: equipment loading/unloading (trucks hauling loose materials must be covered), replace ground cover in disturbed areas quickly, water exposed surfaces 2x daily, water unpaved access roads 3x daily, and reduce speed on unpaved roads to less than 15 mph.
Mitigation for fugitive dust included: water exposed surfaces 3x daily.
The fugitive dust mitigation measures were applied based on the SJVAPCD Rule 8021; the most stringent watering techniques were applied
A PM reduction of 69% was applied to the equipment loading/unloading per SCAQMD Guidance (Table XI-A Mitigation Measure Examples: Fugitive Dust from Construction & Demolition).
Exhaust emissions were not controlled in URBEMIS2007 as the default, unmitigated emission factors used by URBEMIS2007 create a fleet-average Tier 2 mix
Mitigation was applied externally to the exhaust emissions based on the fleet-average Tier mix and the required % reductions to meet Tier 4 standards, based on SCAQMD Table II - Off-Road Engine Emission Rates & Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rates.
Mitigation used for architectural coatings included the use of Low-VOC coatings (providing a 10% reduction in ROG emissions).
No architectural coatings for the Overnight Layover / Servicing Facility.
Project-specific data was used to determine the construction schedule for the HMF and Overnight Layover / Servicing Facility. See the 'Schedule' tab for details
Only used the default equipment as provided in URBEMIS2007 for the construction of the Overnight Layover / Servicing Facility and HMF
For Grading and Paving, assume default URBEMIS2007 number of workers (125% of # of construction equipment) and no vendors
For Building construction, assume default URBEMIS2007 number of vendor trips (0.38 trips / 1,000 sqft) and worker trips (0.42 trips / 1,000 sqft)
For Architectural Coatings, assume default URBEMIS2007 number of worker trips (20% of the building construction worker trips) and no vendor trips.
For operational VMT, assume no truck deliveries to the Overnight Layover / Servicing Facility.
Offsite operational VMT were calculated using emission factors from EMFAC2007 for year 2035 (all Vehicle MYs). The temperature and relative humidity used for the analysis were taken for the SJV area from Table B-1 of CTEFMAC Handbook. A speed of 35 mph was assumed to account for combined city/hwy driving.
Offsite operational emission factors are from EMFAC2007 (Version 2.3) for passenger vehicles (50% LDA-All and 50% of the average of LDT1-All and LDT2-All) and delivery trucks (average of LHD1-DSL and LHD2-DSL) traveling at 35 mph.
Offsite operational VMT for workers will assume 20% carpool based on data provided in Heavy Maintenance Facility TM 5.3 (August 2009).
Assume a round trip distance of 40 miles for employees and 120 miles for deliveries for the HMF offsite operations.
Operational emissions from onsite vehicles used by facility personnel were not included as the diesel fuel used by the equipment is accounted for in the stationary source combustion calculations
Operations assumes employees work 7 days per week, 24 hrs per day
Onsite operational emissions for ROG, CO, NOx, SOx, PM_{10}, $PM_{2.5}$, and CO_2 followed the methodology prepared by Parsons Brinckerhoff, as prepared in July 2011.
For the Existing Conditions Plus Project, offsite operational emissions for the Overnight Layover / Servicing Facility and the HMF were estimated using 2009 emission factors. No change was deemed necessary for the HMF onsite operational emissions

A.16 Maintenance Facilities

Data Taken from Project Descriptions
Data used in calculations

General Notes:
At the TSMF and HMF:
A two-way circulation road, 24 feet wide, would follow the interior perimeter of each facility
• For the HMF, a 50-foot wide asphalt "apron" would surround the main shop building to provide
• Roadways to provide access to specific locations in the building(s) and yard(s) would be considered, as shown on the conceptual schematic
• For the HMF, a pedestrian "bridge" over the train yard tracks would be used to connect the employees' parking lot on one side of the yard tracks and the main shop building on the other side

Material Considerations:

Refueling facilities will be needed for diesel locomotives and DMUs. Storage for hazardous materials and fuel must be in a secure place with proper fire protection facilities. Waste disposal must also be properly managed and waste recovered if possible. (RT, 2010)
Industrial cleaning solutions – degreasers, etc. These include organic degreasers (citrus based) or VOC type degreasers (items such as zylene, acetone, alcohol, etc.). The quantity of degreasers would be in the order of 5 - 10 55 gallon drums as large quantities are needed and resupply would be on a weekly or monthly basis. (JV, 05/19/10)
Industrial applications – paints, thinners, greases, lubricants. These include low or no-VOC (water based paint). Probably around a few hundred gallons of each. Also included would be around 150 cans of commercial spray paint, 150 cans of spray lubricants, and several 55 gallon drums of graphite bases or silicon based bearing grease. (JV, 05/19/10)
Mechanical applications – including oxygen, acetylene, welding rod, welding flux (resin), solder, etc. The quantity would be a few hundred pounds of each. (JV, 05/19/10)
Misc. stuff. – This includes silicon caulking, specialized solvents for small applications, glues, etc. All are small in quantity (a case or two) and all can be found at any home store. (JV, 05/19/10)
Sand - 1,000 lbs (JV, 05/06/2010)
Generally all tanks will be above ground storage tanks so will emit small amounts of VOCs. These will not be quantified and would be permitted as a part of the facility

A.17 Merced Train Station

Data Taken from Project Descriptions or Providec
Estimated Values
Data used in calculations

Station Construction Data

Construction Start Date:	Starts October 2014
Construction Duration (months):	59

Type of Structure	# per station
Concrete Containment Barrier	2
Concrete Poles	3
Pedestrian Bridge	2

STATION BUILDINGS: STRUCTURE TYPE	Length (ft)	Width (ft)	Area (ft^2)	Height (ft)	Notes
Station House / Entry Hall	120	180	21600	At grade - 0 feet	Materials: 00' concrete foundation, steel frame, and dual glaze glass exterior enclosure walls Data Chen 04/26/10 and 5/3/10
Fare Paid Area / Passenger Concourse (waiting lounge, concessions, etc)	120	360	43200	16	Material: concrete slab, steel studs with gypsum board interior walls, and dual glaze glass exterior enclosure walls Data Chen 04/26/10 and 5/3/10
Fare Free area (meet& greet, ticketing, check-in, concessions, etc	120	240	28800	16	Material: concrete slab, steel studs with gypsum board interior walls, and dual glaze glass exterior enclosure walls Data Chen 04/26/10 and 5/3/10
Back of the house operations (staff area, service and mechanical room, underneath concourse level)	120	100	12000	0	Materials: concrete foundation, steel frame, concrete blocks and dual glaze glass exterior enclosure walls Data Chen 04/26/10 and 5/3/10
Total Station Buildings	NA	NA	105,600	NA	Provide approximate sqft of total building structures to be constructed
PLATFORMS	Length (ft)	Width (ft)	Area (ft2)	Height (ft)	Notes
Controlled Areas/platforms	NA	NA	3,000	NA	
HSR Platform	1,380	122	168,360	53	Elevated over SR99 and WSP. Confirmed by Chen 04/26/10. Total 30 ft each with track length. Materials: Concrete 5/3/10
Concrete Containment Barrier	1,380	20	27,600	3	Alan to confirm
Concrete Poles	1,380	7	8,970	52	2 columns or 3 columns - 50 to 60 feet apart - Alan to confirm
Pedestrian Bridge I (connecting entry hall to concourse level)	60	140	8,400	26.5	Materials: concrete or steel structure, and dual glaze glass exterior enclosure walls Data Chen 04/26/10 and 5/3/10
Pedestrian Bridge II (connecting parking structure to concourse level.)	35	150	5,250	16	Materials: concrete or steel structure, and dual glaze glass exterior enclosure walls Data Chen 04/26/10 and 5/3/10. Don't know how thick assume about 30 inches

TRACK ALIGNMENT					
	Length (ft)	Width (ft)	Area (ft^2)	Height (ft)	Notes
Amount of rail	3,000	4 tracks			Tangent track required in each direction from center of platform with possible storage
Terminus Station	4 x 400 meters beyond station			60	Overnight storage. HST guide way is elevated approximately 60 feet above grade

PARKING FACILITIES

	Length (ft)	Width (ft)	Area (ft^2)	# Levels	# stalls
Parking Lot A	400	300	120,000	7	2,850
Parking Lot B	400	300	120,000	7	2,850
Parking Lot C	400	300	120,000	5	2,400

3 Parking structures will be located adjacent to one another. It was assumed that all 3 structures were identical in length and width but that they had varying parking levels. The total number of parking spaces created for this scenario is 7,700.

TOTAL STATION FOOTPRINT

	Length (ft)	Width (ft)	Area (ft^2)		Notes	Area (acres)	25% of Area (Acres)
Station Footprint (Total area to be graded, distance from station center)	NA	NA	198,360		As per Direction from Chen 04/26/10. Not used to provide for a conservative analysis.	4.55	1.14
Station Roof	Height: 90.5 feet				Could be concrete or steel frame with dual glaze glass enclosure panels. Data Chen 5/3/10		

Station Operational Data

Stationary Sources: No stationary source operating data

Traffic Data:

Operational Year	2035	
Number of visitors per day	7,600	% Distribution
Arrive via Shuttle / Bus	608	8%
Arrive Via Car	6,688	88%
Bike /walk	304	4%
Number of additional Employees per day	40	N/A

Total visitors per day and mode distribution percentages taken from Appendix D of the Merced to Fresno Section's Transportation Technical Repo

A.17 Merced Train Station

Data Taken from Project Descriptions or Providec
Estimated Values
Data used in calculations

Assumptions for Construction and Operation Emissions:

Assume no soil hauling for station construction
Assume 5 work days per week (URBEMIS2007 default) for construction phases
Assume mass site grading rather than fine site grading. Fine site grading is the defaul
Use the General Light Industry Land Use Category in URBEMIS2007
Land Use was based on the total building construction area (Station Buildings and Parking Facilities = 465,600 sqft). This is the total amount of buildings assumed in the construction analysis. This is a conservative approach since the building footprint data provided by the architect (195,210) was not used in this analysis.
The worst-case parking scenario was used for modeling purposes. This scenario involves 3 adjacent parking structures, instead of one parking structure next to an existing parking lot.
No paving activities will occur because no surface parking lots were considered in the worst-case scenario. It is conservatively assumed that the light duty industrial assumptions are applicable to the construction of the parking garage.
Assumed the maximum daily acres graded were 25% of the total acres graded (URBEMIS2007 default)
URBEMIS2007 assumes the total acres graded are 2x the building area; assume this is accurate for the grading phase
Programmatic mitigation for fugitive dust included: equipment loading/unloading (trucks hauling loose materials must be covered), replace ground cover in disturbed areas quickly, water exposed surfaces 2x daily, water unpaved access roads 3x daily, and reduce speed on unpaved roads to less than 15 mph.
Mitigation for fugitive dust included: water exposed surfaces 3x daily
The fugitive dust mitigation measures were applied based on the SJVAPCD Rule 8021; the most stringent watering techniques were applie
A PM reduction of 69% was applied to the equipment loading/unloading per SCAQMD Guidance (Table XI-A Mitigation Measure Examples: Fugitive Dust from Construction & Demolition).
Exhaust emissions were not controlled in URBEMIS2007 as the default, unmitigated emission factors used by URBEMIS2007 create a fleet-average Tier 2 mi
Mitigation was applied externally to the exhaust emissions based on the fleet-average Tier mix and the required % reductions to meet Tier 4 standards, based on SCAQMD Table II - Off-Road Engine Emission Rates & Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rates.
Mitigation used for architectural coatings included the use of Low-VOC coatings (providing a 10% reduction in ROG emissions
The URBEMIS2007 default construction phases last a total of 10 months (assume no paving). These phases will be scaled to a total of 59 months in the absence of more specific data. See the 'Schedule' tab for details.
For Grading, assume default URBEMIS2007 number of workers (125% of # of construction equipment) and no vendors
For Building construction, assume default URBEMIS2007 number of vendor trips (0.38 trips / 1,000 sqft) and worker trips (0.42 trips / 1,000 sqf
For Architectural Coatings, assume default URBEMIS2007 number of worker trips (20% of the building construction worker trips) and no vendor trip
Only using the default equipment as provided in URBEMIS2007 for the construction of the Merced Train Statior
Construction of the Fresno Train Station was conservatively modeled using the schedule depicted on the 'Schedule' tab and all of the Merced Train Station input
URBEMIS2007 was used to calculate operation emissions from area sources (natural gas usage and landscaping
Natural Gas Fuel Consumption (for space heating) was considered as contributing to operational emissions. URBEMIS2007 assumes that 100% of nonresidential facilities use natural gas with an industrial usage rate of 241,611 cubic feet/industry/month.
Landscape Fuel Consumption was also considered as contributing to operational emissions. URBEMIS2007 uses the length of summer (180 days) and the year being analyzed (2035) to estimate emissions.
Operation emissions were based on a land use equal to the Station Buildings area (sqft). Parking structures were not included as they are not heated and require minimal landscaping.
Operation emissions were analyzed for the project year of 2035
Operations assumes employees work 7 days per week, 24 hrs per day
Operational VMT for workers will assume 20% carpool based on data provided in Heavy Maintenance Facility TM 5.3 (August 2009
Operational VMT were calculated using emission factors from EMFAC2007 for year 2035 (all Vehicle MYs). The temperature and relative humidity used for the analysis was taken for the SJV area from Table B-1 of CTEFMAC Handbook. A speed of 35 mph was assumed to account for combined city/hwy driving.
Emission factors are from EMFAC2007 (Version 2.3) for passenger vehicles (50% LDA-All and 50% of the average of LDT1-All and LDT2-All) and urban buses (UBUS-All) traveling at 35 mpl
For 2035 operations, the bus emission factors were determined using only 2023 - 2035 model years based on a 12-year usable life span for city buses (FTA *Useful Life of Transit Buses and Vans*, April 2007).
Operational VMT for visitors will be broken down into travelers by bus, car, and bike/walk
Each bus is expected to hold 30 visitors; this generates a total of 30 bus trips per day for 2035 (Lightbody, James/AECOM. Personal communication with Andrea White/CH2M HILL. July 22, 2010).
Assume a round trip distance of 40 miles for employees, visitors by shuttle/bus and visitors by car for facility operations. Assume a round trip distance of 5 miles for visitors by bike/walk.
Biking or Walking generates zero emissions, giving an emission factor of 0 g/mile for all pollutants
Assume no truck deliveries as part of the operations
Operation emissions for the purchased electricity consumed by the Merced Train Station were calculated based on the building square footage and consumption rates provided in Table A9-11-A of the 1993 CEQA Handbook.
Emission factors for electricity consumption from U.S. EPA eGRID2010 Version 1.0 (2007 data) for the WECC California subregior
Fresno Train Station Operational emissions were calculated by URS as part of the analysis for the Fresno - Bakersfield segmen
Operational impacts from the 3 parking structures were determined using CALINE4 with the conservative assumption that all vehicles left the structure within the same 1 hour period (Figure depicting the 3 structures is included below).
As a conservative estimate, only one parking level within each structure was modeled. The results were then multiplied by the total number of levels within the applicable structure.
The worst-case impacts were determined by summing the emissions from all 3 structures
Emission factors used to run CALINE4 were obtained using EMFAC2007 and were the fleet-average for the San Joaquinn Valley Air Basin in winter condition
For the Existing Conditions plus Project operational emissions, ran URBEMIS2007 for the year 2009 using the same assumptions as for 203

A.18 Material Hauling

Estimated Values

Data used in calculations

Data for Cut and Fill Calculations

Is 25% daily acreage reasonable? What is the max amount of area graded per day?	Max would be 200 feet per day based on schedule and quantity	Build a mile of straight rail in about 1 - 1.5 months				
	BNSF (Avenue 21 Wye)	BNSF (Avenue 24 Wye)	UPRR (Avenue 21 Wye)	UPRR (Avenue 24 Wye)	Hybrid (Avenue 24 Wye)	Hybrid (Avenue 21 Wye)
Excavation						
Total Cut Exported (CY)	1,933,624	1,940,235	1,583,622	1,682,694	1,578,833	1,652,999
Daily Cut Exported (CY/day) [1]	3,453	3,465	2,828	3,005	2,819	2,952
Fill						
Total Fill Imported (CY)	1,006,617	972,960	582,890	683,307	856,656	772,066
Daily Fill Imported (CY/day) [1]	1,798	1,737	1,041	1,220	1,530	1,379
Total						
Total Cut / Fill (CY)	2,940,241	2,913,194	2,166,513	2,366,001	2,435,489	2,425,066
Daily Cut / Fill (CY/day)	5,250	5,202	3,869	4,225	4,349	4,330

Note:

1. Daily Cut / Fill values were computed assuming 280 construction work days per year and that the material exported or imported would be hauled over a 24-month period.

Project Data

Material Hauled	Quantity for At-Grade	Quantity for Elevated [1]	Quantity for Retained Fill [2]	Units	Material Origin	Distance Travelled (miles)	# Trucks	Notes
Excavation (Cut) [3]	4.5	3.1	0.4	cy / linear ft	Foothills	60 one way		Based on getting material within the valley needed to bring to the foothills.
Concrete (Total)	0	10	80	cy / linear ft	Assume that this is from the batch plant.	Assume within 10 miles		Used for elevated structures' footing columns, sidewalks, and barriers as well as for retained fill's retaining wall.
Cement (to make concrete) [4]	0	564	564	lb / cy concrete	Assume within 125 miles of batch plant	125 one way		Material delivered to batch plant to make concrete. Assume batch plant operates 8 hrs/day, 280 days/year. Years of operation can be found on 'Schedule' tab.
Sand (to make concrete) [4]	0	1,428	1,428	lb / cy concrete	Assume within 125 miles of batch plant	125 one way		Material delivered to batch plant to make concrete. Assume batch plant operates 8 hrs/day, 280 days/year. Years of operation can be found on 'Schedule' tab.
Gravel (to make concrete) [4]	0	1,865	1,865	lb / cy concrete	Assume within 125 miles of batch plant	125 one way		Material delivered to batch plant to make concrete. Assume batch plant operates 8 hrs/day, 280 days/year. Years of operation can be found on 'Schedule' tab.
Reinforcing Steel	0	2,400	310	lb / linear ft	Bay Area Region (Port of Oakland)	60 one way		
Ballast [3]	1.9	1.9	1.9	cy / linear ft	From SJVAB border.	145 one way by rail, 42 one way by truck		Quarries may be located beyond the SJVAB. Rail will transport material from the SJVAB border to the project mid-point; haul trucks will transport material from the mid-point along the alignment.
Sub-ballast [3]	1.5	1.5	1.5	cy / linear ft	From Quarries.	145 one way by rail, 42 one way by truck		Quarries may be located beyond the SJVAB. Rail will transport material from the SJVAB border to the project mid-point; haul trucks will transport material from the mid-point along the alignment. Distances traveled outside SJVAB are discussed separately.
Fill [3]	2.1	0	17.5	cy / linear ft	Foothills	60 one way		Based on getting material within the valley
Rail	264	264	264	lb / linear ft	Not applicable; likely up to 1,000 miles but only 1 delivery.	Pueblo CO, Portland OR	1 delivery of material of rail. Put it onto the track and then drag using a rail mounted truck and small locomotive 300 - 300 hp (5 mph - idling). Approximately 120 hrs to transport running rail from siding to where it needs to go.	Data provided for entire section: assumes for double track section that will use prewelding 1,000 foot strings of rail. Delivered via rail transportation (i.e. build siding along the rail car). This will be done to minimize rail.
Concrete Railway Ties	0.5	0.5	0.5	# of ties / linear ft	Precast locations	120 miles one way	Each truck has a capacity of 35,000 - 40,000 lbs. Each tie weighs 1,000 lbs.	One tie per foot - precast

Note:

1. Elevated Concrete and Steel data provided by D. Fredericks to K. Skadberg (3/28/11).
2. Retained Fill Concrete and Steel data provided by V. Chio to K. Skadberg (3/22/11).
3. Excavation, Fill, Ballast, and Sub-ballast data for all track types provided by V. Chio to K. Skadberg (3/22/11).
4. Cement, Sand, and Gravel data taken from the composition of concrete (*BAAQMD Permit Handbook 11.5 Concrete Batch Plants*).

Assumptions:

Cut is exported offsite and Fill is imported to the site. As a result, both Cut and Fill materials were considered "offsite" materials in URBEMIS2007 (SMAQMD, CEQA Guide, Chapter 3 Example Projects, December 2009).
Cut and Fill materials are also moved onsite using a scaper. As a result, both cut and fill materials were also considered "onsite" materials in URBEMIS2007.
The modeling of Cut and Fill in URBEMIS2007 are detailed on the 'Alignment' tab.
Soil hauling estimates were not included in URBEMIS2007 as material hauling was calculated externally for all materials included in the table above.
Assume there is no fugitive dust associated with hauling materials, only vehicle exhaust emissions.
The number of haul trucks will be based on the total amount of material hauled and an assumed truck capacity of 20 cy/truck.
The cement, sand, and gravel hauling will use trucks with a capacity of 30 tons/truck.
The concrete hauling will use trucks with a capacity of 14 cy/truck, as provided by the engineering team of URS.
The HHDT Emission Factors for SJVAPCD will be used in EMFAC to determine vehicle exhaust emissions.
Distance traveled will be estimated based on the origin of the material being delivered.
Concrete ties are located one every 2 feet and there are 2 tracks - concrete tie plant in CA somewhere so assume shipped from SD to SF or SF to SD.
Cannot assume that material will not be recycled - unknown what % is organic matter.
Assumption is that it will be built using access from state highway and local roads.
Material haul: quantities will be delivered over the time frame of the use in the construction phase (as per schedule).
For mitigated emissions, assume all trucks meet the 2010 emission standards throughout the construction period (i.e. run EMFAC with for 2010 with only model year 2010 vehicles).
Assume the material use for the wyes is the same as that for the double track. All values presented are based on double track.
Material hauling of ballast and sub-ballast will assume that railcars transport the material from the edge of the SJVAB to the construction site (midpoint of the alignment). Haul trucks will then make one trip from the construction site to the end of the alignment and back, delivering material along the way.
Regardless of which quarry is used to obtain the the ballast and sub-ballast material, assume that the one-way distance between the construction site and the border of the SJVAB is 145 miles. This is a conservative approach using the distance from the furthest rail entry point.
The distance by which haul trucks carry ballast and sub-ballast material will be conservatively set equal to the maximum possible alignment length.
Emission factors are for line-haul locomotives taken from or derived per the EPA document "Emission Factors for Locomotives" (April 2009).

APPENDIX B

Construction Emissions

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B.1 HST Construction Emissions Summary

B.1-1 Summary of Construction-Related GHG Emissions

This tab provides the GHG emissions resulting from all construction activities associated with each Alternative and the HMF. Data are pulled from other tabs contained within this workbook.

BNSF Ave 21 Alternative

Construction Year	CO_2 Emissions (tpy) [1]	CO_2 Emissions (metric tons/year)
Construction Emissions (Programmatic)		
2013 [2]	86,991	78,918
2014	174,959	158,722
2015	168,395	152,767
2016	159,087	144,323
2017	158,386	143,687
2018	50,376	45,701
2019	46,808	42,464
2021	98,182	89,070
Total CO_2	**943,185**	**855,652**
Total CO_2e [3]	**990,345**	**898,435**
Construction Emissions (Mitigated)		
2013 [2]	86,946	78,877
2014	174,836	158,610
2015	168,294	152,675
2016	159,026	144,267
2017	158,331	143,637
2018	50,375	45,700
2019	46,808	42,464
2021	98,075	88,974
Total CO_2	**942,691**	**855,204**
Total CO_2e [3]	**989,826**	**897,964**

BNSF Ave 24 Alternative

Construction Year	CO_2 Emissions (tpy) [1]	CO_2 Emissions (metric tons/year)
Construction Emissions (Programmatic)		
2013 [2]	93,544	84,862
2014	183,289	166,279
2015	175,547	159,255
2016	166,337	150,900
2017	165,175	149,846
2018	50,376	45,701
2019	46,808	42,464
2021	98,182	89,070
Total CO_2	**979,258**	**888,377**
Total CO_2e [3]	**1,028,221**	**932,796**
Construction Emissions (Mitigated)		
2013 [2]	93,495	84,818
2014	183,158	166,160
2015	175,438	159,157
2016	166,269	150,838
2017	165,113	149,789
2018	50,375	45,700
2019	46,808	42,464
2021	98,075	88,974
Total CO_2	**978,732**	**887,900**
Total CO_2e [3]	**1,027,669**	**932,295**

B.1-1 Summary of Construction-Related GHG Emissions

This tab provides the GHG emissions resulting from all construction activities associated with each Alternative and the HMF. Data are pulled from other tabs contained within this workbook.

UPRR Ave 21 Alternative

Construction Year	CO_2 Emissions (tpy) [1]	CO_2 Emissions (metric tons/year)
Construction Emissions (Programmatic)		
2013 [2]	109,428	99,273
2014	184,169	167,077
2015	182,625	165,677
2016	175,224	158,962
2017	181,809	164,936
2018	50,376	45,701
2019	46,808	42,464
2021	98,182	89,070
Total CO_2	**1,028,623**	**933,161**
Total CO_2e [3]	**1,080,054**	**979,819**
Construction Emissions (Mitigated)		
2013 [2]	109,372	99,221
2014	184,029	166,950
2015	182,502	165,565
2016	175,132	158,878
2017	181,723	164,858
2018	50,375	45,700
2019	46,808	42,464
2021	98,075	88,974
Total CO_2	**1,028,016**	**932,610**
Total CO_2e [3]	**1,079,416**	**979,240**

UPRR Ave 24 Alternative

Construction Year	CO_2 Emissions (tpy) [1]	CO_2 Emissions (metric tons/year)
Construction Emissions (Programmatic)		
2013 [2]	106,569	96,678
2014	182,755	165,795
2015	181,169	164,356
2016	172,737	156,706
2017	174,500	158,305
2018	50,376	45,701
2019	46,808	42,464
2021	98,182	89,070
Total CO_2	**1,013,096**	**919,075**
Total CO_2e [3]	**1,063,751**	**965,028**
Construction Emissions (Mitigated)		
2013 [2]	106,516	96,630
2014	182,621	165,672
2015	181,053	164,250
2016	172,653	156,630
2017	174,422	158,235
2018	50,375	45,700
2019	46,808	42,464
2021	98,075	88,974
Total CO_2	**1,012,524**	**918,555**
Total CO_2e [3]	**1,063,150**	**964,483**

B.1-1 Summary of Construction-Related GHG Emissions

This tab provides the GHG emissions resulting from all construction activities associated with each Alternative and the HMF. Data are pulled from other tabs contained within this workbook.

Hybrid Ave 24 Alternative

Construction Year	CO_2 Emissions (tpy) [1]	CO_2 Emissions (metric tons/year)
Construction Emissions (Programmatic)		
2013 [2]	83,127	75,412
2014	135,037	122,505
2015	127,298	115,484
2016	120,131	108,982
2017	125,692	114,027
2018	50,376	45,701
2019	46,808	42,464
2021	98,182	89,070
Total CO_2	**786,652**	**713,646**
Total CO_2e [3]	**825,984**	**749,328**
Construction Emissions (Mitigated)		
2013 [2]	83,096	75,384
2014	134,948	122,424
2015	127,227	115,419
2016	120,093	108,948
2017	125,659	113,997
2018	50,375	45,700
2019	46,808	42,464
2021	98,075	88,974
Total CO_2	**786,280**	**713,309**
Total CO_2e [3]	**825,594**	**748,974**

Hybrid Ave 21 Alternative

Construction Year	CO_2 Emissions (tpy) [1]	CO_2 Emissions (metric tons/year)
Construction Emissions (Programmatic)		
2013 [2]	91,997	83,459
2014	160,663	145,753
2015	154,739	140,378
2016	147,456	133,771
2017	155,630	141,186
2018	50,376	45,701
2019	46,808	42,464
2021	98,182	89,070
Total CO_2	**905,851**	**821,783**
Total CO_2e [3]	**951,144**	**862,872**
Construction Emissions (Mitigated)		
2013 [2]	91,954	83,420
2014	160,549	145,649
2015	154,644	140,292
2016	147,394	133,715
2017	155,573	141,135
2018	50,375	45,700
2019	46,808	42,464
2021	98,075	88,974
Total CO_2	**905,373**	**821,349**
Total CO_2e [3]	**950,642**	**862,417**

Notes:

1. Only emissions released within the San Joaquin Valley Air Basin have been included above.

2. Only the worst-case demolition activities, occurring in 2013, were included for each Alternative, regardless of the Wyes (i.e. either the Ave 21 or the Ave 24 Alternative).

3. According to the EPA (http://www.epa.gov/oms/climate/420f05004.htm), emissions of CH_4 and N_2O from passenger vehicles are much lower than emissions of CO_2, contributing in the range of 5-6 percent of the CO_2-equivalent emissions. In addition, the URBEMIS2007 model does not estimate CH_4 and N_2O emissions. Therefore, to account for the CH_4 and N_2O emissions, the CO_2 emissions were conservatively increased by 5 percent to calculate the CO_2-equivalent emissions. Assumed that this approach for passenger vehicles was applicable to all emissions sources.

B.1-2 BNSF Ave 21: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the BNSF Ave 21 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	21	80	243	0	0	8	8	0	8	8	30,952
Site Preparation - Demolition [1]	10	48	134	0	183	5	188	38	5	43	24,711
Site Preparation - Land Clearing	0	1	3	0	0	0	0	0	0	0	293
Earth Moving	1	3	5	0	19	0	20	4	0	4	524
Roadway Crossings [2]	11	49	93	0	4	4	8	1	4	5	11,152
Elevated Structures - Construction	6	33	49	0	0	2	2	0	2	2	7,851
Elevated Structures - Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
Material Hauling [3]	4	21	73	0	-	4	4	-	3	3	11,507
2014 Construction											
Earth Moving	1	2	4	0	58	0	58	12	0	12	503
Roadway Crossings [2]	6	26	44	0	2	2	4	0	2	3	5,435
Elevated Structures - Construction	12	64	96	0	0	4	4	0	4	4	15,491
Elevated Structures - Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
Lay Track	90	465	716	0	1	32	33	0	30	30	113,434
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	11	-	11	11	-	11	-
Merced Station Construction	0	1	1	0	1	0	1	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	15	76	278	0	-	12	12	-	10	10	39,966
2015 Construction											
Earth Moving	0	1	2	0	38	0	38	8	0	8	203
Roadway Crossings [2]	3	14	21	0	1	1	2	0	1	1	3,067
Elevated Structures - Construction	12	64	96	0	0	4	4	0	4	4	15,491
Elevated Structures - Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
Lay Track	90	465	716	0	1	32	33	0	30	30	113,434
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	11	-	11	11	-	11	-
Merced Station Construction	1	5	4	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	3	0	-	-	1	-	-	0	584
Material Hauling [3]	12	63	225	0	-	9	9	-	8	8	34,621
2016 Construction											
Roadway Crossings [2]	2	11	15	0	1	1	1	0	1	1	2,209
Elevated Structures - Construction	12	64	96	0	0	4	4	0	4	4	15,491
Elevated Structures - Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
Lay Track	90	465	716	0	1	32	33	0	30	30	113,434
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	11	-	11	11	-	11	-
Merced Station Construction	1	7	4	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	8	44	157	0	-	6	6	-	5	5	23,936
Systems - Traction Power Supply Station	0	1	2	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	3	0	0	0	0	0	0	0	462
Systems - Paralleling Station	1	3	4	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	13	61	88	0	6	4	10	1	4	5	14,561
Elevated Structures - Construction	12	64	96	0	0	4	4	0	4	4	15,491
Elevated Structures - Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
Lay Track	67	347	536	0	1	24	25	0	22	22	84,833
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	11	-	11	11	-	11	-
Merced Station Construction	1	6	4	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,122
Material Hauling [3]	6	34	110	0	-	5	5	-	4	4	20,065
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	2	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	3	0	0	0	0	0	0	0	470
Demobilization	21	57	167	0	0	7	7	0	7	7	19,279
HMF (Phase I)	0	2	2	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	318
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	1	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	1	0	0	0	0	0	0	0	197
Demobilization	53	138	407	0	0	17	17	0	16	16	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	3	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	3	1	1	0	-	-	0	-	-	0	380
Demobilization	56	142	414	0	0	18	18	0	17	17	46,164
2021 Construction											
Material Hauling [3]	6	42	97	0	-	5	5	-	4	4	32,850
HMF (Phase 3) - Facility Construction	8	3	2	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	33	198	217	0	0	9	10	0	8	9	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	24	-	24	24	-	24	-
2013 Total	**53**	**235**	**598**	**0**	**213**	**24**	**237**	**50**	**22**	**72**	**86,991**
2014 Total	**124**	**634**	**1,140**	**1**	**81**	**51**	**132**	**32**	**46**	**78**	**174,959**
2015 Total	**118**	**615**	**1,066**	**1**	**61**	**47**	**109**	**27**	**43**	**71**	**168,395**
2016 Total	**115**	**602**	**1,000**	**0**	**22**	**44**	**66**	**19**	**40**	**60**	**159,087**
2017 Total	**120**	**580**	**1,013**	**0**	**31**	**45**	**76**	**21**	**41**	**62**	**158,386**
2018 Total	**55**	**154**	**420**	**0**	**0**	**17**	**18**	**0**	**17**	**17**	**50,376**
2019 Total	**65**	**144**	**416**	**0**	**0**	**18**	**18**	**0**	**17**	**17**	**46,808**
2021 Total	**47**	**243**	**315**	**0**	**32**	**15**	**47**	**31**	**13**	**44**	**98,182**

Notes:

1. Only the worst-case demolition activities were included for each Alternative, regardless of the Wyes (i.e. the BNSF Demolition is the worst-case emissions from either the BNSF Ave 21 or the BNSF Ave 24 Alternative). The totals also include the HMF demolition emissions.

2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.

3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-2 BNSF Ave 21: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the BNSF Ave 21 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	8	80	27	0	0	1	1	0	1	1	30,952
Site Preparation - Demolition [1]	9	48	130	0	183	5	188	38	4	43	24,711
Site Preparation - Land Clearing	0	1	0	0	0	0	0	0	0	0	293
Earth Moving	0	3	1	0	4	0	4	1	0	1	524
Roadway Crossings [2]	4	49	10	0	4	0	4	1	0	1	11,152
Elevated Structures - Construction	2	33	6	0	0	0	0	0	0	0	7,851
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Material Hauling [3]	1	7	7	0	-	1	1	-	1	1	11,463
2014 Construction											
Earth Moving	0	2	0	0	11	0	11	2	0	2	503
Roadway Crossings [2]	2	26	5	0	2	0	2	0	0	1	5,435
Elevated Structures - Construction	5	64	11	0	0	0	1	0	0	0	15,491
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	35	465	85	0	1	4	5	0	3	4	113,434
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	1	0	0	0	0	0	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	7	38	116	0	-	5	5	-	4	4	39,842
2015 Construction											
Earth Moving	0	1	0	0	7	0	7	2	0	2	203
Roadway Crossings [2]	1	14	2	0	1	0	1	0	0	0	3,067
Elevated Structures - Construction	5	64	11	0	0	0	1	0	0	0	15,491
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	35	465	85	0	1	4	5	0	3	4	113,434
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	5	2	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	0	0	-	-	1	-	-	0	584
Material Hauling [3]	6	35	109	0	-	4	4	-	4	4	34,520
2016 Construction											
Roadway Crossings [2]	1	11	2	0	1	0	1	0	0	0	2,209
Elevated Structures - Construction	5	64	11	0	0	0	1	0	0	0	15,491
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	35	465	85	0	1	4	5	0	3	4	113,434
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	7	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	5	29	97	0	-	3	3	-	3	3	23,875
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	462
Systems - Paralleling Station	0	3	0	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	5	61	10	0	5	0	5	1	0	1	14,561
Elevated Structures - Construction	5	64	11	0	0	0	1	0	0	0	15,491
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	26	347	64	0	1	3	3	0	3	3	84,833
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,122
Material Hauling [3]	3	21	64	0	-	3	3	-	2	2	20,010
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	0	0	0	0	0	0	0	0	470
Demobilization	7	57	19	0	0	1	1	0	1	1	19,279
HMF (Phase I)	0	2	0	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	317
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	0	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	0	0	0	0	0	0	0	0	197
Demobilization	19	138	45	0	0	2	2	0	2	2	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	0	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	1	1	0	0	-	-	0	-	-	0	380
Demobilization	20	142	46	0	0	2	2	0	2	2	46,164
2021 Construction											
Material Hauling [3]	3	26	49	0	-	3	3	-	2	2	32,743
HMF (Phase 3) - Facility Construction	7	3	1	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	13	198	25	0	0	1	2	0	1	1	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2013 Total	**25**	**220**	**181**	**0**	**191**	**7**	**198**	**40**	**6**	**46**	**86,946**
2014 Total	**49**	**596**	**219**	**1**	**16**	**9**	**26**	**4**	**8**	**12**	**174,836**
2015 Total	**47**	**586**	**210**	**1**	**12**	**9**	**22**	**3**	**8**	**11**	**168,294**
2016 Total	**47**	**586**	**200**	**0**	**4**	**8**	**12**	**1**	**7**	**8**	**159,026**
2017 Total	**47**	**568**	**171**	**0**	**12**	**7**	**20**	**3**	**6**	**9**	**158,331**
2018 Total	**20**	**154**	**49**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**50,375**
2019 Total	**26**	**144**	**47**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**46,808**
2021 Total	**23**	**226**	**75**	**0**	**2**	**4**	**6**	**1**	**3**	**4**	**98,075**

Notes:

1. Only the worst-case demolition activities were included for each Alternative, regardless of the Wyes (i.e. the BNSF Demolition is the worst-case emissions from either the BNSF Ave 21 or the BNSF Ave 24 Alternative). The totals also include the HMF demolition emissions.
2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.
3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-3 BNSF Ave 24: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the BNSF Ave 24 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	21	80	243	0	0	8	8	0	8	8	30,952
Site Preparation - Demolition [1]	10	48	134	0	183	5	188	38	5	43	24,711
Site Preparation - Land Clearing	0	1	3	0	0	0	0	0	0	0	293
Earth Moving	1	3	5	0	19	0	19	4	0	4	524
Roadway Crossings [2]	14	62	118	0	5	5	10	1	5	6	14,104
Elevated Structures - Construction	8	44	66	0	0	3	3	0	3	3	10,561
Elevated Structures - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Material Hauling [3]	5	23	78	0	-	4	4	-	3	3	12,398
2014 Construction											
Earth Moving	1	2	4	0	57	0	57	12	0	12	503
Roadway Crossings [2]	7	32	55	0	3	3	5	1	3	3	6,662
Elevated Structures - Construction	16	86	130	0	0	6	6	0	5	5	20,839
Elevated Structures - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Lay Track	90	465	712	0	1	32	33	0	30	30	113,223
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	11	-	11	11	-	11	-
Merced Station Construction	0	1	1	0	1	0	1	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	16	79	290	0	-	12	12	-	11	11	41,932
2015 Construction											
Earth Moving	0	1	2	0	38	0	38	8	0	8	203
Roadway Crossings [2]	3	14	21	0	1	1	2	0	1	1	3,067
Elevated Structures - Construction	16	86	130	0	0	6	6	0	5	5	20,839
Elevated Structures - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Lay Track	90	465	712	0	1	32	33	0	30	30	113,223
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	11	-	11	11	-	11	-
Merced Station Construction	1	5	4	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	3	0	-	-	1	-	-	0	584
Material Hauling [3]	13	67	236	0	-	10	10	-	9	9	36,637
2016 Construction											
Roadway Crossings [2]	2	11	15	0	1	1	1	0	1	1	2,209
Elevated Structures - Construction	16	86	130	0	0	6	6	0	5	5	20,839
Elevated Structures - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Lay Track	90	465	712	0	1	32	33	0	30	30	113,223
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	11	-	11	11	-	11	-
Merced Station Construction	1	7	4	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	9	48	167	0	-	7	7	-	6	6	26,049
Systems - Traction Power Supply Station	0	1	2	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	3	0	0	0	0	0	0	0	462
Systems - Paralleling Station	1	3	4	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	12	59	86	0	5	4	9	1	4	5	14,120
Elevated Structures - Construction	16	86	130	0	0	6	6	0	5	5	20,839
Elevated Structures - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Lay Track	67	347	532	0	1	24	25	0	22	22	84,681
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	11	-	11	11	-	11	-
Merced Station Construction	1	6	4	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,122
Material Hauling [3]	6	37	119	0	-	5	5	-	4	4	22,100
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	2	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	3	0	0	0	0	0	0	0	470
Demobilization	21	57	167	0	0	7	7	0	7	7	19,279
HMF (Phase I)	0	2	2	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	318
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	1	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	1	0	0	0	0	0	0	0	197
Demobilization	53	138	407	0	0	17	17	0	16	16	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	3	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	3	1	1	0	-	-	0	-	-	0	380
Demobilization	56	142	414	0	0	18	18	0	17	17	46,164
2021 Construction											
Material Hauling [3]	6	42	97	0	-	5	5	-	4	4	32,850
HMF (Phase 3) - Facility Construction	8	3	2	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	33	198	217	0	0	9	10	0	8	9	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	24	-	24	24	-	24	-
2013 Total	**59**	**261**	**645**	**0**	**216**	**26**	**242**	**52**	**24**	**76**	**93,544**
2014 Total	**130**	**666**	**1,191**	**1**	**83**	**54**	**137**	**34**	**49**	**82**	**183,289**
2015 Total	**123**	**641**	**1,106**	**1**	**63**	**49**	**113**	**30**	**45**	**75**	**175,547**
2016 Total	**119**	**627**	**1,039**	**0**	**24**	**46**	**70**	**22**	**42**	**64**	**166,337**
2017 Total	**124**	**604**	**1,048**	**0**	**34**	**46**	**80**	**23**	**42**	**66**	**165,175**
2018 Total	**55**	**154**	**420**	**0**	**0**	**17**	**18**	**0**	**17**	**17**	**50,376**
2019 Total	**65**	**144**	**416**	**0**	**0**	**18**	**18**	**0**	**17**	**17**	**46,808**
2021 Total	**47**	**243**	**315**	**0**	**32**	**15**	**47**	**31**	**13**	**44**	**98,182**

Notes:

1. Only the worst-case demolition activities were included for each Alternative, regardless of the Wyes (i.e. the BNSF Demolition is the worst-case emissions from either the BNSF Ave 21 or the BNSF Ave 24 Alternative). The totals also include the HMF demolition emissions.

2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.

3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-3 BNSF Ave 24: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the BNSF Ave 24 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	8	80	27	0	0	1	1	0	1	1	30,952
Site Preparation - Demolition [1]	9	48	130	0	183	5	188	38	4	43	24,711
Site Preparation - Land Clearing	0	1	0	0	0	0	0	0	0	0	293
Earth Moving	0	3	1	0	4	0	4	1	0	1	524
Roadway Crossings [2]	5	62	13	0	4	1	5	1	0	1	14,104
Elevated Structures - Construction	3	44	8	0	0	0	0	0	0	0	10,561
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Material Hauling [3]	1	7	7	0	-	1	1	-	1	1	12,350
2014 Construction											
Earth Moving	0	2	0	0	11	0	11	2	0	2	503
Roadway Crossings [2]	3	32	6	0	2	0	3	0	0	1	6,662
Elevated Structures - Construction	6	86	15	0	0	1	1	0	1	1	20,839
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	35	465	85	0	1	4	5	0	3	4	113,223
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	1	0	0	0	0	0	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	7	39	119	0	-	5	5	-	4	4	41,801
2015 Construction											
Earth Moving	0	1	0	0	7	0	7	2	0	2	203
Roadway Crossings [2]	1	14	2	0	1	0	1	0	0	0	3,067
Elevated Structures - Construction	6	86	15	0	0	1	1	0	1	1	20,839
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	35	465	85	0	1	4	5	0	3	4	113,223
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	5	2	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	0	0	-	-	1	-	-	0	584
Material Hauling [3]	6	36	112	0	-	5	5	-	4	4	36,528
2016 Construction											
Roadway Crossings [2]	1	11	2	0	1	0	1	0	0	0	2,209
Elevated Structures - Construction	6	86	15	0	0	1	1	0	1	1	20,839
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	35	465	85	0	1	4	5	0	3	4	113,223
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	7	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	5	30	100	0	-	4	4	-	3	3	25,981
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	462
Systems - Paralleling Station	0	3	0	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	5	59	10	0	5	0	5	1	0	1	14,120
Elevated Structures - Construction	6	86	15	0	0	1	1	0	1	1	20,839
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	26	347	64	0	1	3	3	0	2	3	84,681
Lay Track - Fugitive Dust	-	-	-	-	2	-	2	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,122
Material Hauling [3]	3	23	66	0	-	3	3	-	2	2	22,038
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	0	0	0	0	0	0	0	0	470
Demobilization	7	57	19	0	0	1	1	0	1	1	19,279
HMF (Phase I)	0	2	0	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	317
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	0	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	0	0	0	0	0	0	0	0	197
Demobilization	19	138	45	0	0	2	2	0	2	2	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	0	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	1	1	0	0	-	-	0	-	-	0	380
Demobilization	20	142	46	0	0	2	2	0	2	2	46,164
2021 Construction											
Material Hauling [3]	3	26	49	0	-	3	3	-	2	2	32,743
HMF (Phase 3) - Facility Construction	7	3	1	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	13	198	25	0	0	1	2	0	1	1	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2013 Total	**27**	**245**	**186**	**0**	**192**	**8**	**199**	**40**	**7**	**47**	**93,495**
2014 Total	**51**	**626**	**226**	**1**	**17**	**10**	**27**	**4**	**8**	**12**	**183,158**
2015 Total	**49**	**610**	**217**	**1**	**12**	**9**	**22**	**3**	**8**	**11**	**175,438**
2016 Total	**48**	**610**	**206**	**0**	**4**	**8**	**12**	**1**	**7**	**8**	**166,269**
2017 Total	**49**	**589**	**177**	**0**	**12**	**7**	**20**	**3**	**6**	**9**	**165,113**
2018 Total	**20**	**154**	**49**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**50,375**
2019 Total	**26**	**144**	**47**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**46,808**
2021 Total	**23**	**226**	**75**	**0**	**2**	**4**	**6**	**1**	**3**	**4**	**98,075**

Notes:

1. Only the worst-case demolition activities were included for each Alternative, regardless of the Wyes (i.e. the BNSF Demolition is the worst-case emissions from either the BNSF Ave 21 or the BNSF Ave 24 Alternative). The totals also include the HMF demolition emissions.

2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.

3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-4 UPRR Ave 21: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the UPRR Ave 21 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	21	80	243	0	0	8	8	0	8	8	30,952
Site Preparation - Demolition [1]	13	63	176	0	243	7	250	51	6	57	32,729
Site Preparation - Land Clearing	0	1	3	0	0	0	0	0	0	0	293
Earth Moving	1	3	5	0	14	0	14	3	0	3	524
Roadway Crossings [2]	7	32	60	0	3	3	5	1	2	3	7,216
Elevated Structures - Construction	18	96	144	0	0	6	7	0	6	6	23,165
Elevated Structures - Concrete Batch Plant	-	-	-	-	20	-	20	20	-	20	-
Material Hauling [3]	5	27	92	0	-	5	5	-	4	4	14,548
2014 Construction											
Earth Moving	1	2	4	0	43	0	43	9	0	9	503
Roadway Crossings [2]	5	24	40	0	2	2	4	0	2	2	4,999
Elevated Structures - Construction	35	189	284	0	0	13	13	0	12	12	45,709
Elevated Structures - Concrete Batch Plant	-	-	-	-	20	-	20	20	-	20	-
Lay Track	69	373	543	0	1	25	26	0	23	23	89,087
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Merced Station Construction	0	1	1	0	1	0	1	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	16	82	295	0	-	13	13	-	11	11	43,742
2015 Construction											
Earth Moving	0	1	2	0	28	0	28	6	0	6	203
Roadway Crossings [2]	6	29	43	0	2	2	4	0	2	2	6,245
Elevated Structures - Construction	35	189	284	0	0	13	13	0	12	12	45,709
Elevated Structures - Concrete Batch Plant	-	-	-	-	20	-	20	20	-	20	-
Lay Track	69	373	543	0	1	25	26	0	23	23	89,087
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Merced Station Construction	1	5	4	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	3	0	-	-	1	-	-	0	584
Material Hauling [3]	14	71	245	0	-	11	11	-	9	9	39,803
2016 Construction											
Roadway Crossings [2]	5	22	30	0	1	2	3	0	1	2	4,483
Elevated Structures - Construction	35	189	284	0	0	13	13	0	12	12	45,709
Elevated Structures - Concrete Batch Plant	-	-	-	-	20	-	20	20	-	20	-
Lay Track	69	373	543	0	1	25	26	0	23	23	89,087
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Merced Station Construction	1	7	4	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	10	56	186	0	-	8	8	-	7	7	31,929
Systems - Traction Power Supply Station	0	1	2	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	3	0	0	0	0	0	0	0	462
Systems - Paralleling Station	1	3	4	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	15	74	107	0	7	5	12	1	5	6	17,650
Elevated Structures - Construction	35	189	284	0	0	13	13	0	12	12	45,709
Elevated Structures - Concrete Batch Plant	-	-	-	-	20	-	20	20	-	20	-
Lay Track	52	277	406	0	1	18	19	0	17	17	66,658
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Merced Station Construction	1	6	4	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,122
Material Hauling [3]	8	45	138	0	-	6	6	-	5	5	28,358
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	2	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	3	0	0	0	0	0	0	0	470
Demobilization	21	57	167	0	0	7	7	0	7	7	19,279
HMF (Phase I)	0	2	2	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	318
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	1	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	1	0	0	0	0	0	0	0	197
Demobilization	53	138	407	0	0	17	17	0	16	16	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	3	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	3	1	1	0	-	-	0	-	-	0	380
Demobilization	56	142	414	0	0	18	18	0	17	17	46,164
2021 Construction											
Material Hauling [3]	6	42	97	0	-	5	5	-	4	4	32,850
HMF (Phase 3) - Facility Construction	8	3	2	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	33	198	217	0	0	9	10	0	8	9	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	24	-	24	24	-	24	-
2013 Total	**65**	**302**	**722**	**0**	**281**	**29**	**310**	**75**	**26**	**101**	**109,428**
2014 Total	**127**	**671**	**1,167**	**1**	**76**	**53**	**129**	**39**	**48**	**87**	**184,169**
2015 Total	**125**	**671**	**1,123**	**1**	**63**	**50**	**114**	**36**	**46**	**82**	**182,625**
2016 Total	**122**	**657**	**1,060**	**1**	**33**	**48**	**81**	**30**	**43**	**73**	**175,224**
2017 Total	**133**	**659**	**1,117**	**0**	**43**	**50**	**93**	**32**	**46**	**78**	**181,809**
2018 Total	**55**	**154**	**420**	**0**	**0**	**17**	**18**	**0**	**17**	**17**	**50,376**
2019 Total	**65**	**144**	**416**	**0**	**0**	**18**	**18**	**0**	**17**	**17**	**46,808**
2021 Total	**47**	**243**	**315**	**0**	**32**	**15**	**47**	**31**	**13**	**44**	**98,182**

Notes:

1. Only the worst-case demolition activities were included for each Alternative, regardless of the Wyes (i.e. the UPRR Demolition is the worst-case emissions from either the UPRR Ave 21 or the UPRR Ave 24 Alternative). The totals also include the HMF demolition emissions.

2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.

3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-4 UPRR Ave 21: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the UPRR Ave 21 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	8	80	27	0	0	1	1	0	1	1	30,952
Site Preparation - Demolition [1]	12	63	173	0	243	6	250	51	6	57	32,729
Site Preparation - Land Clearing	0	1	0	0	0	0	0	0	0	0	293
Earth Moving	0	3	1	0	3	0	3	1	0	1	524
Roadway Crossings [2]	3	32	7	0	2	0	3	0	0	1	7,216
Elevated Structures - Construction	7	96	17	0	0	1	1	0	1	1	23,165
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Material Hauling [3]	1	8	8	0	-	1	1	-	1	1	14,492
2014 Construction											
Earth Moving	0	2	0	0	8	0	8	2	0	2	503
Roadway Crossings [2]	2	24	5	0	2	0	2	0	0	1	4,999
Elevated Structures - Construction	14	189	34	0	0	1	2	0	1	1	45,709
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	27	373	66	0	1	3	4	0	3	3	89,087
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	1	0	0	0	0	0	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	6	39	111	0	-	5	5	-	4	4	43,602
2015 Construction											
Earth Moving	0	1	0	0	5	0	5	1	0	1	203
Roadway Crossings [2]	2	29	5	0	2	0	2	0	0	1	6,245
Elevated Structures - Construction	14	189	34	0	0	1	2	0	1	1	45,709
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	27	373	66	0	1	3	4	0	3	3	89,087
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	5	2	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	0	0	-	-	1	-	-	0	584
Material Hauling [3]	6	37	105	0	-	5	5	-	4	4	39,680
2016 Construction											
Roadway Crossings [2]	2	22	4	0	1	0	1	0	0	0	4,483
Elevated Structures - Construction	14	189	34	0	0	1	2	0	1	1	45,709
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	27	373	66	0	1	3	4	0	3	3	89,087
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	7	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	5	32	95	0	-	4	4	-	3	3	31,836
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	462
Systems - Paralleling Station	0	3	0	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	6	74	12	0	6	1	7	1	0	2	17,650
Elevated Structures - Construction	14	189	34	0	0	1	2	0	1	1	45,709
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	20	277	49	0	1	2	3	0	2	2	66,658
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,122
Material Hauling [3]	4	25	64	0	-	3	3	-	2	2	28,271
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	0	0	0	0	0	0	0	0	470
Demobilization	7	57	19	0	0	1	1	0	1	1	19,279
HMF (Phase I)	0	2	0	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	317
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	0	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	0	0	0	0	0	0	0	0	197
Demobilization	19	138	45	0	0	2	2	0	2	2	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	0	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	1	1	0	0	-	-	0	-	-	0	380
Demobilization	20	142	46	0	0	2	2	0	2	2	46,164
2021 Construction											
Material Hauling [3]	3	26	49	0	-	3	3	-	2	2	32,743
HMF (Phase 3) - Facility Construction	7	3	1	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	13	198	25	0	0	1	2	0	1	1	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2013 Total	**31**	**283**	**233**	**0**	**249**	**9**	**259**	**52**	**8**	**61**	**109,372**
2014 Total	**50**	**628**	**216**	**1**	**13**	**10**	**23**	**3**	**8**	**12**	**184,029**
2015 Total	**50**	**636**	**211**	**1**	**11**	**9**	**22**	**3**	**8**	**11**	**182,502**
2016 Total	**49**	**633**	**203**	**1**	**4**	**9**	**13**	**1**	**7**	**9**	**175,132**
2017 Total	**52**	**639**	**182**	**0**	**14**	**8**	**22**	**3**	**7**	**10**	**181,723**
2018 Total	**20**	**154**	**49**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**50,375**
2019 Total	**26**	**144**	**47**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**46,808**
2021 Total	**23**	**226**	**75**	**0**	**2**	**4**	**6**	**1**	**3**	**4**	**98,075**

Notes:

1. Only the worst-case demolition activities were included for each Alternative, regardless of the Wyes (i.e. the UPRR Demolition is the worst-case emissions from either the UPRR Ave 21 or the UPRR Ave 24 Alternative). The totals also include the HMF demolition emissions.

2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.

3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-5 UPRR Ave 24: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the UPRR Ave 24 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	21	80	243	0	0	8	8	0	8	8	30,952
Site Preparation - Demolition [1]	13	63	176	0	243	7	250	51	6	57	32,729
Site Preparation - Land Clearing	0	1	3	0	0	0	0	0	0	0	293
Earth Moving	1	3	5	0	16	0	16	3	0	3	524
Roadway Crossings [2]	9	40	77	0	3	3	7	1	3	4	9,184
Elevated Structures - Construction	15	80	120	0	0	5	5	0	5	5	19,291
Elevated Structures - Concrete Batch Plant	-	-	-	-	17	-	17	17	-	17	-
Material Hauling [3]	5	25	86	0	-	4	4	-	4	4	13,595
2014 Construction											
Earth Moving	1	2	4	0	46	0	47	10	0	10	503
Roadway Crossings [2]	6	28	46	0	2	2	4	0	2	3	5,817
Elevated Structures - Construction	30	158	237	0	0	11	11	0	10	10	38,064
Elevated Structures - Concrete Batch Plant	-	-	-	-	17	-	17	17	-	17	-
Lay Track	75	398	591	0	1	27	28	0	25	25	95,773
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Merced Station Construction	0	1	1	0	1	0	1	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	16	80	289	0	-	12	12	-	11	11	42,468
2015 Construction											
Earth Moving	0	1	2	0	31	0	31	6	0	6	203
Roadway Crossings [2]	7	34	51	0	2	2	5	1	2	3	7,383
Elevated Structures - Construction	30	158	237	0	0	11	11	0	10	10	38,064
Elevated Structures - Concrete Batch Plant	-	-	-	-	17	-	17	17	-	17	-
Lay Track	75	398	591	0	1	27	28	0	25	25	95,773
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Merced Station Construction	1	5	4	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	3	0	-	-	1	-	-	0	584
Material Hauling [3]	13	69	239	0	-	10	10	-	9	9	38,167
2016 Construction											
Roadway Crossings [2]	5	26	35	0	2	2	3	0	2	2	5,314
Elevated Structures - Construction	30	158	237	0	0	11	11	0	10	10	38,064
Elevated Structures - Concrete Batch Plant	-	-	-	-	17	-	17	17	-	17	-
Lay Track	75	398	591	0	1	27	28	0	25	25	95,773
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Merced Station Construction	1	7	4	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	10	52	178	0	-	7	7	-	6	6	29,568
Systems - Traction Power Supply Station	0	1	2	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	3	0	0	0	0	0	0	0	462
Systems - Paralleling Station	1	3	4	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	13	65	94	0	6	4	10	1	4	5	15,443
Elevated Structures - Construction	30	158	237	0	0	11	11	0	10	10	38,064
Elevated Structures - Concrete Batch Plant	-	-	-	-	17	-	17	17	-	17	-
Lay Track	56	296	441	0	1	20	21	0	18	18	71,650
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	9	-	9	9	-	9	-
Merced Station Construction	1	6	4	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,122
Material Hauling [3]	7	42	130	0	-	6	6	-	5	5	25,907
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	2	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	3	0	0	0	0	0	0	0	470
Demobilization	21	57	167	0	0	7	7	0	7	7	19,279
HMF (Phase I)	0	2	2	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	318
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	1	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	1	0	0	0	0	0	0	0	197
Demobilization	53	138	407	0	0	17	17	0	16	16	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	3	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	3	1	1	0	-	-	0	-	-	0	380
Demobilization	56	142	414	0	0	18	18	0	17	17	46,164
2021 Construction											
Material Hauling [3]	6	42	97	0	-	5	5	-	4	4	32,850
HMF (Phase 3) - Facility Construction	8	3	2	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	33	198	217	0	0	9	10	0	8	9	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	24	-	24	24	-	24	-
2013 Total	**64**	**292**	**709**	**0**	**279**	**28**	**308**	**72**	**26**	**98**	**106,569**
2014 Total	**128**	**667**	**1,168**	**1**	**77**	**53**	**130**	**36**	**48**	**84**	**182,755**
2015 Total	**126**	**667**	**1,124**	**1**	**62**	**50**	**114**	**33**	**46**	**79**	**181,169**
2016 Total	**122**	**651**	**1,056**	**1**	**30**	**47**	**77**	**27**	**43**	**70**	**172,737**
2017 Total	**129**	**635**	**1,083**	**0**	**39**	**48**	**87**	**28**	**44**	**73**	**174,500**
2018 Total	**55**	**154**	**420**	**0**	**0**	**17**	**18**	**0**	**17**	**17**	**50,376**
2019 Total	**65**	**144**	**416**	**0**	**0**	**18**	**18**	**0**	**17**	**17**	**46,808**
2021 Total	**47**	**243**	**315**	**0**	**32**	**15**	**47**	**31**	**13**	**44**	**98,182**

Notes:

1. Only the worst-case demolition activities were included for each Alternative, regardless of the Wyes (i.e. the UPRR Demolition is the worst-case emissions from either the UPRR Ave 21 or the UPRR Ave 24 Alternative). The totals also include the HMF demolition emissions.

2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.

3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-5 UPRR Ave 24: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the UPRR Ave 24 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	8	80	27	0	0	1	1	0	1	1	30,952
Site Preparation - Demolition [1]	12	63	173	0	243	6	250	51	6	57	32,729
Site Preparation - Land Clearing	0	1	0	0	0	0	0	0	0	0	293
Earth Moving	0	3	1	0	3	0	3	1	0	1	524
Roadway Crossings [2]	3	40	9	0	3	0	3	1	0	1	9,184
Elevated Structures - Construction	6	80	14	0	0	1	1	0	1	1	19,291
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Material Hauling [3]	1	8	8	0	-	1	1	-	1	1	13,542
2014 Construction											
Earth Moving	0	2	0	0	9	0	9	2	0	2	503
Roadway Crossings [2]	2	28	5	0	2	0	2	0	0	1	5,817
Elevated Structures - Construction	11	158	28	0	0	1	1	0	1	1	38,064
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	30	398	71	0	1	3	4	0	3	3	95,773
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	1	0	0	0	0	0	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	6	38	112	0	-	5	5	-	4	4	42,333
2015 Construction											
Earth Moving	0	1	0	0	6	0	6	1	0	1	203
Roadway Crossings [2]	3	34	6	0	2	0	2	0	0	1	7,383
Elevated Structures - Construction	11	158	28	0	0	1	1	0	1	1	38,064
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	30	398	71	0	1	3	4	0	3	3	95,773
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	5	2	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	0	0	-	-	1	-	-	0	584
Material Hauling [3]	6	36	106	0	-	5	5	-	4	4	38,051
2016 Construction											
Roadway Crossings [2]	2	26	5	0	1	0	2	0	0	0	5,314
Elevated Structures - Construction	11	158	28	0	0	1	1	0	1	1	38,064
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	30	398	71	0	1	3	4	0	3	3	95,773
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	7	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	5	31	96	0	-	4	4	-	3	3	29,485
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	462
Systems - Paralleling Station	0	3	0	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	5	65	11	0	5	0	6	1	0	2	15,443
Elevated Structures - Construction	11	158	28	0	0	1	1	0	1	1	38,064
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	22	296	53	0	1	2	3	0	2	2	71,650
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,122
Material Hauling [3]	3	24	64	0	-	3	3	-	2	2	25,829
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	0	0	0	0	0	0	0	0	470
Demobilization	7	57	19	0	0	1	1	0	1	1	19,279
HMF (Phase I)	0	2	0	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	317
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	0	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	0	0	0	0	0	0	0	0	197
Demobilization	19	138	45	0	0	2	2	0	2	2	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	0	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	1	1	0	0	-	-	0	-	-	0	380
Demobilization	20	142	46	0	0	2	2	0	2	2	46,164
2021 Construction											
Material Hauling [3]	3	26	49	0	-	3	3	-	2	2	32,743
HMF (Phase 3) - Facility Construction	7	3	1	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	13	198	25	0	0	1	2	0	1	1	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2013 Total	**31**	**275**	**231**	**0**	**250**	**9**	**259**	**52**	**8**	**61**	**106,516**
2014 Total	**50**	**625**	**218**	**1**	**14**	**10**	**24**	**4**	**8**	**12**	**182,621**
2015 Total	**50**	**635**	**213**	**1**	**12**	**9**	**22**	**3**	**8**	**11**	**181,053**
2016 Total	**49**	**630**	**204**	**1**	**5**	**9**	**13**	**1**	**7**	**9**	**172,653**
2017 Total	**50**	**617**	**178**	**0**	**13**	**8**	**21**	**3**	**7**	**10**	**174,422**
2018 Total	**20**	**154**	**49**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**50,375**
2019 Total	**26**	**144**	**47**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**46,808**
2021 Total	**23**	**226**	**75**	**0**	**2**	**4**	**6**	**1**	**3**	**4**	**98,075**

Notes:

1. Only the worst-case demolition activities were included for each Alternative, regardless of the Wyes (i.e. the UPRR Demolition is the worst-case emissions from either the UPRR Ave 21 or the UPRR Ave 24 Alternative). The totals also include the HMF demolition emissions.

2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.

3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-6 Hybrid Ave 24: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the Hybrid Ave 24 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	21	80	243	0	0	8	8	0	8	8	30,952
Site Preparation - Demolition [1]	11	53	148	0	203	6	208	42	5	47	27,333
Site Preparation - Land Clearing	0	1	3	0	0	0	0	0	0	0	293
Earth Moving	1	3	5	0	16	0	16	3	0	4	524
Roadway Crossings [2]	14	59	112	0	5	5	10	1	5	6	13,448
Elevated Structures - Construction	2	11	17	0	0	1	1	0	1	1	2,673
Elevated Structures - Concrete Batch Plant	-	-	-	-	2	-	2	2	-	2	-
Material Hauling [3]	3	15	50	0	-	2	2	-	2	2	7,903
2014 Construction											
Earth Moving	1	2	4	0	48	0	48	10	0	10	503
Roadway Crossings [2]	7	30	52	0	2	3	5	1	3	3	6,390
Elevated Structures - Construction	4	22	33	0	0	1	2	0	1	1	5,275
Elevated Structures - Concrete Batch Plant	-	-	-	-	2	-	2	2	-	2	-
Lay Track	74	381	594	0	1	27	27	0	25	25	93,323
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	8	-	8	8	-	8	-
Merced Station Construction	0	1	1	0	1	0	1	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	11	56	208	0	-	9	9	-	8	8	29,417
2015 Construction											
Earth Moving	0	1	2	0	32	0	32	7	0	7	203
Roadway Crossings [2]	2	9	13	0	1	1	1	0	1	1	1,929
Elevated Structures - Construction	4	22	33	0	0	1	2	0	1	1	5,275
Elevated Structures - Concrete Batch Plant	-	-	-	-	2	-	2	2	-	2	-
Lay Track	74	381	594	0	1	27	27	0	25	25	93,323
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	8	-	8	8	-	8	-
Merced Station Construction	1	5	4	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	3	0	-	-	1	-	-	0	584
Material Hauling [3]	9	46	166	0	-	7	7	-	6	6	24,990
2016 Construction											
Roadway Crossings [2]	1	7	9	0	0	0	1	0	0	0	1,377
Elevated Structures - Construction	4	22	33	0	0	1	2	0	1	1	5,275
Elevated Structures - Concrete Batch Plant	-	-	-	-	2	-	2	2	-	2	-
Lay Track	74	381	594	0	1	27	27	0	25	25	93,323
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	8	-	8	8	-	8	-
Merced Station Construction	1	7	4	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	6	31	112	0	-	4	4	-	4	4	16,139
Systems - Traction Power Supply Station	0	1	2	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	3	0	0	0	0	0	0	0	462
Systems - Paralleling Station	1	3	4	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	12	59	86	0	5	4	9	1	4	5	14,120
Elevated Structures - Construction	4	22	33	0	0	1	2	0	1	1	5,275
Elevated Structures - Concrete Batch Plant	-	-	-	-	2	-	2	2	-	2	-
Lay Track	56	285	444	0	0	20	20	0	18	19	69,785
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	8	-	8	8	-	8	-
Merced Station Construction	1	6	4	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,122
Material Hauling [3]	4	23	77	0	-	3	3	-	3	3	13,077
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	2	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	3	0	0	0	0	0	0	0	470
Demobilization	21	57	167	0	0	7	7	0	7	7	19,279
HMF (Phase I)	0	2	2	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	318
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	1	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	1	0	0	0	0	0	0	0	197
Demobilization	53	138	407	0	0	17	17	0	16	16	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	3	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	3	1	1	0	-	-	0	-	-	0	380
Demobilization	56	142	414	0	0	18	18	0	17	17	46,164
2021 Construction											
Material Hauling [3]	6	42	97	0	-	5	5	-	4	4	32,850
HMF (Phase 3) - Facility Construction	8	3	2	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	33	198	217	0	0	9	10	0	8	9	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	24	-	24	24	-	24	-
2013 Total	**51**	**222**	**576**	**0**	**226**	**22**	**248**	**49**	**21**	**70**	**83,127**
2014 Total	**98**	**492**	**892**	**0**	**63**	**40**	**104**	**22**	**36**	**58**	**135,037**
2015 Total	**90**	**466**	**814**	**0**	**46**	**36**	**83**	**18**	**33**	**51**	**127,298**
2016 Total	**88**	**458**	**764**	**0**	**13**	**33**	**47**	**11**	**31**	**42**	**120,131**
2017 Total	**99**	**463**	**822**	**0**	**23**	**36**	**59**	**13**	**33**	**47**	**125,692**
2018 Total	**55**	**154**	**420**	**0**	**0**	**17**	**18**	**0**	**17**	**17**	**50,376**
2019 Total	**65**	**144**	**416**	**0**	**0**	**18**	**18**	**0**	**17**	**17**	**46,808**
2021 Total	**47**	**243**	**315**	**0**	**32**	**15**	**47**	**31**	**13**	**44**	**98,182**

Notes:

1. The totals include the HMF demolition emissions.
2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.
3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-6 Hybrid Ave 24: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the Hybrid Ave 24 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	8	80	27	0	0	1	1	0	1	1	30,952
Site Preparation - Demolition [1]	10	53	144	0	203	5	208	42	5	47	27,333
Site Preparation - Land Clearing	0	1	0	0	0	0	0	0	0	0	293
Earth Moving	0	3	1	0	3	0	3	1	0	1	524
Roadway Crossings [2]	5	59	13	0	4	1	5	1	0	1	13,448
Elevated Structures - Construction	1	11	2	0	0	0	0	0	0	0	2,673
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Material Hauling [3]	0	5	5	0	-	1	1	-	0	0	7,873
2014 Construction											
Earth Moving	0	2	0	0	9	0	9	2	0	2	503
Roadway Crossings [2]	3	30	6	0	2	0	2	0	0	1	6,390
Elevated Structures - Construction	2	22	4	0	0	0	0	0	0	0	5,275
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	29	381	71	0	1	3	4	0	3	3	93,323
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	1	0	0	0	0	0	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	5	29	91	0	-	4	4	-	3	3	29,327
2015 Construction											
Earth Moving	0	1	0	0	6	0	6	1	0	1	203
Roadway Crossings [2]	1	9	1	0	1	0	1	0	0	0	1,929
Elevated Structures - Construction	2	22	4	0	0	0	0	0	0	0	5,275
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	29	381	71	0	1	3	4	0	3	3	93,323
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	5	2	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	0	0	-	-	1	-	-	0	584
Material Hauling [3]	5	26	85	0	-	3	3	-	3	3	24,919
2016 Construction											
Roadway Crossings [2]	1	7	1	0	0	0	0	0	0	0	1,377
Elevated Structures - Construction	2	22	4	0	0	0	0	0	0	0	5,275
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	29	381	71	0	1	3	4	0	3	3	93,323
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	7	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	4	21	75	0	-	3	3	-	2	2	16,101
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	462
Systems - Paralleling Station	0	3	0	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	5	59	10	0	5	0	5	1	0	1	14,120
Elevated Structures - Construction	2	22	4	0	0	0	0	0	0	0	5,275
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	22	285	53	0	0	2	3	0	2	2	69,785
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,122
Material Hauling [3]	2	15	49	0	-	2	2	-	1	1	13,043
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	0	0	0	0	0	0	0	0	470
Demobilization	7	57	19	0	0	1	1	0	1	1	19,279
HMF (Phase I)	0	2	0	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	317
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	0	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	0	0	0	0	0	0	0	0	197
Demobilization	19	138	45	0	0	2	2	0	2	2	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	0	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	1	1	0	0	-	-	0	-	-	0	380
Demobilization	20	142	46	0	0	2	2	0	2	2	46,164
2021 Construction											
Material Hauling [3]	3	26	49	0	-	3	3	-	2	2	32,743
HMF (Phase 3) - Facility Construction	7	3	1	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	13	198	25	0	0	1	2	0	1	1	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2013 Total	**25**	**211**	**191**	**0**	**210**	**7**	**218**	**44**	**7**	**51**	**83,096**
2014 Total	**38**	**465**	**172**	**0**	**14**	**7**	**22**	**3**	**6**	**9**	**134,948**
2015 Total	**36**	**446**	**163**	**0**	**10**	**7**	**17**	**2**	**6**	**8**	**127,227**
2016 Total	**36**	**448**	**155**	**0**	**3**	**6**	**9**	**1**	**5**	**6**	**120,093**
2017 Total	**39**	**455**	**138**	**0**	**12**	**6**	**17**	**3**	**5**	**8**	**125,659**
2018 Total	**20**	**154**	**49**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**50,375**
2019 Total	**26**	**144**	**47**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**46,808**
2021 Total	**23**	**226**	**75**	**0**	**2**	**4**	**6**	**1**	**3**	**4**	**98,075**

Notes:

1. The totals include the HMF demolition emissions.
2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.
3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-7 Hybrid Ave 21: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the Hybrid Ave 21 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	21	80	243	0	0	8	8	0	8	8	30,952
Site Preparation - Demolition [1]	11	53	148	0	203	6	208	42	5	47	27,333
Site Preparation - Land Clearing	0	1	3	0	0	0	0	0	0	0	293
Earth Moving	1	3	5	0	16	0	16	3	0	4	524
Roadway Crossings [2]	11	46	87	0	4	4	8	1	4	4	10,496
Elevated Structures - Construction	9	47	71	0	0	3	3	0	3	3	11,466
Elevated Structures - Concrete Batch Plant	-	-	-	-	10	-	10	10	-	10	-
Material Hauling [3]	4	20	69	0	-	3	3	-	3	3	10,933
2014 Construction											
Earth Moving	1	2	4	0	48	0	48	10	0	10	503
Roadway Crossings [2]	6	25	42	0	2	2	4	0	2	2	5,163
Elevated Structures - Construction	18	94	141	0	0	6	6	0	6	6	22,624
Elevated Structures - Concrete Batch Plant	-	-	-	-	10	-	10	10	-	10	-
Lay Track	76	394	599	0	1	27	28	0	25	25	95,733
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	8	-	8	8	-	8	-
Merced Station Construction	0	1	1	0	1	0	1	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	14	69	252	0	-	11	11	-	9	9	36,510
2015 Construction											
Earth Moving	0	1	2	0	32	0	32	7	0	7	203
Roadway Crossings [2]	2	12	17	0	1	1	2	0	1	1	2,498
Elevated Structures - Construction	18	94	141	0	0	6	6	0	6	6	22,624
Elevated Structures - Concrete Batch Plant	-	-	-	-	10	-	10	10	-	10	-
Lay Track	76	394	599	0	1	27	28	0	25	25	95,733
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	8	-	8	8	-	8	-
Merced Station Construction	1	5	4	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	3	0	-	-	1	-	-	0	584
Material Hauling [3]	11	58	206	0	-	9	9	-	8	8	32,102
2016 Construction											
Roadway Crossings [2]	2	9	12	0	0	1	1	0	1	1	1,793
Elevated Structures - Construction	18	94	141	0	0	6	6	0	6	6	22,624
Elevated Structures - Concrete Batch Plant	-	-	-	-	10	-	10	10	-	10	-
Lay Track	76	394	599	0	1	27	28	0	25	25	95,733
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	8	-	8	8	-	8	-
Merced Station Construction	1	7	4	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	8	42	148	0	-	6	6	-	5	5	23,289
Systems - Traction Power Supply Station	0	1	2	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	3	0	0	0	0	0	0	0	462
Systems - Paralleling Station	1	3	4	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	16	76	110	0	7	5	12	1	5	6	18,091
Elevated Structures - Construction	18	94	141	0	0	6	6	0	6	6	22,624
Elevated Structures - Concrete Batch Plant	-	-	-	-	10	-	10	10	-	10	-
Lay Track	56	294	448	0	1	20	21	0	19	19	71,605
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	8	-	8	8	-	8	-
Merced Station Construction	1	6	4	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	3	0	-	-	0	-	-	0	1,122
Material Hauling [3]	6	33	105	0	-	5	5	-	4	4	19,875
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	2	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	3	0	0	0	0	0	0	0	470
Demobilization	21	57	167	0	0	7	7	0	7	7	19,279
HMF (Phase I)	0	2	2	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	3	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	318
Systems - Traction Power Supply Station	0	1	1	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	1	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	1	0	0	0	0	0	0	0	197
Demobilization	53	138	407	0	0	17	17	0	16	16	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	3	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	3	1	1	0	-	-	0	-	-	0	380
Demobilization	56	142	414	0	0	18	18	0	17	17	46,164
2021 Construction											
Material Hauling [3]	6	42	97	0	-	5	5	-	4	4	32,850
HMF (Phase 3) - Facility Construction	8	3	2	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	33	198	217	0	0	9	10	0	8	9	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	7	-	7	7	-	7	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	24	-	24	24	-	24	-
2013 Total	**56**	**251**	**625**	**0**	**233**	**25**	**257**	**56**	**23**	**79**	**91,997**
2014 Total	**114**	**585**	**1,039**	**1**	**71**	**47**	**118**	**30**	**42**	**72**	**160,663**
2015 Total	**108**	**567**	**971**	**0**	**54**	**43**	**98**	**26**	**39**	**66**	**154,739**
2016 Total	**105**	**557**	**915**	**0**	**21**	**41**	**62**	**19**	**37**	**56**	**147,456**
2017 Total	**118**	**571**	**986**	**0**	**33**	**44**	**76**	**22**	**40**	**62**	**155,630**
2018 Total	**55**	**154**	**420**	**0**	**0**	**17**	**18**	**0**	**17**	**17**	**50,376**
2019 Total	**65**	**144**	**416**	**0**	**0**	**18**	**18**	**0**	**17**	**17**	**46,808**
2021 Total	**47**	**243**	**315**	**0**	**32**	**15**	**47**	**31**	**13**	**44**	**98,182**

Notes:

1. The totals include the HMF demolition emissions.
2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.
3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-7 Hybrid Ave 21: Summary of Construction Emissions

This tab provides the emissions resulting from all construction activities associated with the Hybrid Ave 21 Alternative. Data are pulled from other tabs contained within this workbook.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mobilization	8	80	27	0	0	1	1	0	1	1	30,952
Site Preparation - Demolition [1]	10	53	144	0	203	5	208	42	5	47	27,333
Site Preparation - Land Clearing	0	1	0	0	0	0	0	0	0	0	293
Earth Moving	0	3	1	0	3	0	3	1	0	1	524
Roadway Crossings [2]	4	46	10	0	3	0	4	1	0	1	10,496
Elevated Structures - Construction	3	47	8	0	0	0	0	0	0	0	11,466
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Material Hauling [3]	1	6	6	0	-	1	1	-	0	0	10,890
2014 Construction											
Earth Moving	0	2	0	0	9	0	9	2	0	2	503
Roadway Crossings [2]	2	25	5	0	2	0	2	0	0	1	5,163
Elevated Structures - Construction	7	94	17	0	0	1	1	0	1	1	22,624
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	30	394	72	0	1	3	4	0	3	3	95,733
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	1	0	0	0	0	0	0	0	0	103
Fresno Station Construction	0	0	0	0	-	-	0	-	-	0	27
Material Hauling [3]	6	34	103	0	-	5	5	-	4	4	36,397
2015 Construction											
Earth Moving	0	1	0	0	6	0	6	1	0	1	203
Roadway Crossings [2]	1	12	2	0	1	0	1	0	0	0	2,498
Elevated Structures - Construction	7	94	17	0	0	1	1	0	1	1	22,624
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	30	394	72	0	1	3	4	0	3	3	95,733
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	5	2	0	1	0	1	0	0	0	994
Fresno Station Construction	0	3	0	0	-	-	1	-	-	0	584
Material Hauling [3]	5	32	97	0	-	4	4	-	3	3	32,007
2016 Construction											
Roadway Crossings [2]	1	9	2	0	0	0	1	0	0	0	1,793
Elevated Structures - Construction	7	94	17	0	0	1	1	0	1	1	22,624
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	30	394	72	0	1	3	4	0	3	3	95,733
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	7	3	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	4	27	87	0	-	3	3	-	3	3	23,227
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	247
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	462
Systems - Paralleling Station	0	3	0	0	0	0	0	0	0	0	616
2017 Construction											
Roadway Crossings [2]	6	76	13	0	6	1	7	1	1	2	18,091
Elevated Structures - Construction	7	94	17	0	0	1	1	0	1	1	22,624
Elevated Structures - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Lay Track	22	294	54	0	1	2	3	0	2	2	71,605
Lay Track - Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
Lay Track - Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,560
Fresno Station Construction	0	5	0	0	-	-	0	-	-	0	1,122
Material Hauling [3]	3	20	57	0	-	2	2	-	2	2	19,818
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	251
Systems - Switching Station	0	2	0	0	0	0	0	0	0	0	352
Systems - Paralleling Station	0	2	0	0	0	0	0	0	0	0	470
Demobilization	7	57	19	0	0	1	1	0	1	1	19,279
HMF (Phase I)	0	2	0	0	5	0	5	1	0	1	400
2018 Construction											
Merced Station Construction	0	6	2	0	0	0	0	0	0	0	1,566
Fresno Station Construction	0	4	0	0	-	-	0	-	-	0	1,127
Material Hauling [3]	0	0	1	0	-	0	0	-	0	0	317
Systems - Traction Power Supply Station	0	1	0	0	0	0	0	0	0	0	147
Systems - Switching Station	0	1	0	0	0	0	0	0	0	0	148
Systems - Paralleling Station	0	1	0	0	0	0	0	0	0	0	197
Demobilization	19	138	45	0	0	2	2	0	2	2	46,164
HMF (Phase 2) - Facility Construction	0	0	0	0	0	0	0	0	0	0	85
HMF (Phase 2) - Elevated Structures and Lay Track	0	2	0	0	0	0	0	0	0	0	624
HMF (Phase 2) - Lay Track Fugitive Dust	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 2) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2019 Construction											
Merced Station Construction	5	1	0	0	0	0	0	0	0	0	264
Fresno Station Construction	1	1	0	0	-	-	0	-	-	0	380
Demobilization	20	142	46	0	0	2	2	0	2	2	46,164
2021 Construction											
Material Hauling [3]	3	26	49	0	-	3	3	-	2	2	32,743
HMF (Phase 3) - Facility Construction	7	3	1	0	0	0	0	0	0	0	1,256
HMF (Phase 3) - Elevated Structures and Lay Track	13	198	25	0	0	1	2	0	1	1	64,076
HMF (Phase 3) - Lay Track Fugitive Dust	-	-	-	-	1	-	1	0	-	0	-
HMF (Phase 3) - Elevated Structures Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
HMF (Phase 3) - Lay Track Concrete Batch Plant	-	-	-	-	0	-	0	0	-	0	-
2013 Total	**26**	**237**	**196**	**0**	**210**	**8**	**217**	**44**	**7**	**51**	**91,954**
2014 Total	**45**	**550**	**197**	**1**	**14**	**9**	**23**	**3**	**7**	**11**	**160,549**
2015 Total	**43**	**540**	**189**	**0**	**10**	**8**	**19**	**3**	**7**	**10**	**154,644**
2016 Total	**43**	**541**	**181**	**0**	**3**	**7**	**11**	**1**	**6**	**7**	**147,394**
2017 Total	**46**	**558**	**163**	**0**	**13**	**7**	**20**	**3**	**6**	**9**	**155,573**
2018 Total	**20**	**154**	**49**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**50,375**
2019 Total	**26**	**144**	**47**	**0**	**0**	**2**	**2**	**0**	**2**	**2**	**46,808**
2021 Total	**23**	**226**	**75**	**0**	**2**	**4**	**6**	**1**	**3**	**4**	**98,075**

Notes:

1. The totals include the HMF demolition emissions.
2. Only the Roadway Projects not included in the Regional Transportation Plan are summed in the emissions above, as they are only occurring due to HST construction.
3. Material Hauling PM Exhaust emissions include emissions from running exhaust, tire wear, and brake wear. Emissions occuring outside of the SJVAB are not included.

B.1-8 Mobilization: Construction Emissions

This tab provides the emissions resulting from mobilization, regardless of Alternative. Assumptions are documented in the Data Request ('Mobilization' tab).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading											
Dust	-	-	-	-	0.000	-	0.000	0.000	-	0.000	-
Off-Road Equipment	21.015	76.125	242.394	0.000	0.000	8.285	8.285	0.000	7.849	7.849	30,527
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.110	3.544	0.185	0.004	0.021	0.012	0.033	0.007	0.010	0.017	426
2013 Total [2]	**21.125**	**79.670**	**242.579**	**0.004**	**0.021**	**8.297**	**8.317**	**0.007**	**7.859**	**7.866**	**30,952**

Notes:

1. Emissions calculated in URBEMIS2007 using a custom land use category similar to an Industrial Park and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.
2. Results include mass site grading; fugitive dust emissions were assumed minimal. Worker trips are also included using the default settings of URBEMIS2007.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
Mass Grading											
Dust	-	-	-	-	0.000	-	0.000	0.000	-	0.000	-
Off-Road Equipment [3]	7.617	76.125	26.903	0.000	0.000	0.840	0.840	0.000	0.796	0.796	30,527
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.110	3.544	0.185	0.004	0.021	0.012	0.033	0.007	0.010	0.017	426
2013 Total [4, 5]	**7.727**	**79.670**	**27.087**	**0.004**	**0.021**	**0.852**	**0.873**	**0.007**	**0.805**	**0.813**	**30,952**

Notes:

1. Emissions calculated in URBEMIS2007 using a custom land use category similar to an Industrial Park.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading; fugitive dust emissions were assumed minimal. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes using off-road construction equipment that meets Tier 4 standards.

B.1-9 Site Preparation: Construction Emissions from Demolition

This tab provides the emissions resulting from demolition by Alternative. Assumptions are documented in the Data Request ('Demolition' tab).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
HMF - CCC Demolition [2]											
Dust	-	-	-	-	31.709	-	31.709	6.595	-	6.595	-
Off-Road Equipment	0.265	1.272	2.131	0.000	0.000	0.099	0.099	0.000	0.091	0.091	227
On-Road Equipment	1.611	7.957	22.527	0.039	0.148	0.843	0.991	0.049	0.776	0.825	4,224
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF Demolition [2]											
Dust	-	-	-	-	150.386	-	150.386	31.280	-	31.280	-
Off-Road Equipment	0.265	1.272	2.131	0.000	0.000	0.099	0.099	0.000	0.091	0.091	227
On-Road Equipment	7.634	37.709	106.763	0.186	0.701	3.998	4.699	0.230	3.678	3.908	20,019
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
UPRR Demolition [2]											
Dust	-	-	-	-	210.605	-	210.605	43.806	-	43.806	-
Off-Road Equipment	0.265	1.272	2.131	0.000	0.000	0.099	0.099	0.000	0.091	0.091	227
On-Road Equipment	10.691	52.812	149.525	0.261	0.982	5.599	6.580	0.322	5.151	5.473	28,037
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Hybrid Demolition											
Dust	-	-	-	-	170.062	-	170.062	35.373	-	35.373	-
Off-Road Equipment	0.265	1.272	2.131	0.000	0.000	0.099	0.099	0.000	0.091	0.091	227
On-Road Equipment	8.633	42.647	120.744	0.211	0.793	4.521	5.314	0.260	4.159	4.420	22,640
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF 2013 Total [3, 4]	**9.778**	**48.327**	**133.558**	**0.226**	**182.944**	**5.039**	**187.983**	**38.155**	**4.636**	**42.791**	**24,711**
UPRR 2013 Total [3, 4]	**12.835**	**63.431**	**176.320**	**0.300**	**243.444**	**6.640**	**250.085**	**50.772**	**6.109**	**56.882**	**32,729**
Hybrid 2013 Total [3, 4]	**10.777**	**53.265**	**147.539**	**0.250**	**202.712**	**5.563**	**208.275**	**42.277**	**5.118**	**47.395**	**27,333**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Heavy Industry land use category.
2. Only the worst-case demolition activities were modeled for each Alternative, regardless of the Wyes (i.e. the BNSF Demolition is the worst-case emissions from either the BNSF Ave 21 or the BNSF Ave 24 Alternative).
3. Results are for demolition activities, including the exhaust emissions from haul trucks removing demolished material from the site. Worker trips are also included using the default settings of URBEMIS2007.
4. The HMF demolition emissions are added to each alignment Alternative to determine the total demolition emissions for each Alternative.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
HMF - CCC Demolition [3]											
Dust	-	-	-	-	31.709	-	31.709	6.595	-	6.595	-
Off-Road Equipment [4]	0.096	1.272	0.237	0.000	0.000	0.010	0.010	0.000	0.009	0.009	227
On-Road Equipment	1.611	7.957	22.527	0.039	0.148	0.843	0.991	0.049	0.776	0.825	4,224
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF Demolition [3]											
Dust	-	-	-	-	150.386	-	150.386	31.280	-	31.280	-
Off-Road Equipment [4]	0.096	1.272	0.237	0.000	0.000	0.010	0.010	0.000	0.009	0.009	227
On-Road Equipment	7.634	37.709	106.763	0.186	0.701	3.998	4.699	0.230	3.678	3.908	20,019
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
UPRR Demolition [3]											
Dust	-	-	-	-	210.605	-	210.605	43.806	-	43.806	-
Off-Road Equipment [4]	0.096	1.272	0.237	0.000	0.000	0.010	0.010	0.000	0.009	0.009	227
On-Road Equipment	10.691	52.812	149.525	0.261	0.982	5.599	6.580	0.322	5.151	5.473	28,037
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Hybrid Demolition											
Dust	-	-	-	-	170.062	-	170.062	35.373	-	35.373	-
Off-Road Equipment [4]	0.096	1.272	0.237	0.000	0.000	0.010	0.010	0.000	0.009	0.009	227
On-Road Equipment	8.633	42.647	120.744	0.211	0.793	4.521	5.314	0.260	4.159	4.420	22,640
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF 2013 Total [5, 6, 7]	**9.440**	**48.327**	**129.769**	**0.226**	**182.944**	**4.862**	**187.806**	**38.155**	**4.473**	**42.627**	**24,711**
UPRR 2013 Total [5, 6, 7]	**12.498**	**63.431**	**172.531**	**0.300**	**243.444**	**6.463**	**249.907**	**50.772**	**5.946**	**56.718**	**32,729**
Hybrid 2013 Total [5, 6, 7]	**10.440**	**53.265**	**143.750**	**0.250**	**202.712**	**5.385**	**208.097**	**42.277**	**4.954**	**47.232**	**27,333**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Heavy Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. Only the worst-case demolition activities were modeled for each Alternative, regardless of the Wyes (i.e. the BNSF Demolition is the worst-case emissions from either the BNSF Ave 21 or the BNSF Ave 24 Alternative).
4. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
5. Results are for demolition activities, including the exhaust emissions from haul trucks removing demolished material from the site. Worker trips are also included using the default settings of URBEMIS2007.
6. The HMF demolition emissions are added to each alignment Alternative to determine the total demolition emissions for each Alternative.
7. Mitigation applied included using off-road construction equipment that meets Tier 4 standards.

B.1-10 Site Preparation: Construction Emissions from Land Clearing

This tab provides the emissions resulting from land clearing by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
BNSF Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.083	-	0.083	0.017	-	0.017	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.083	-	0.083	0.017	-	0.017	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
UPRR Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.083	-	0.083	0.017	-	0.017	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
UPRR Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.083	-	0.083	0.017	-	0.017	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Hybrid Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.083	-	0.083	0.017	-	0.017	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Hybrid Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.083	-	0.083	0.017	-	0.017	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF Ave 21 2013 Total [2]	**0.316**	**1.378**	**2.662**	**0.000**	**0.083**	**0.109**	**0.192**	**0.017**	**0.100**	**0.118**	**293**
BNSF Ave 24 2013 Total [2]	**0.316**	**1.378**	**2.662**	**0.000**	**0.083**	**0.109**	**0.192**	**0.017**	**0.100**	**0.118**	**293**
UPRR Ave 21 2013 Total [2]	**0.316**	**1.378**	**2.662**	**0.000**	**0.083**	**0.109**	**0.192**	**0.017**	**0.100**	**0.118**	**293**
UPRR Ave 24 2013 Total [2]	**0.316**	**1.378**	**2.662**	**0.000**	**0.083**	**0.109**	**0.192**	**0.017**	**0.100**	**0.118**	**293**
Hybrid Ave 24 2013 Total [2]	**0.316**	**1.378**	**2.662**	**0.000**	**0.083**	**0.109**	**0.192**	**0.017**	**0.100**	**0.118**	**293**
Hybrid Ave 21 2013 Total [2]	**0.316**	**1.378**	**2.662**	**0.000**	**0.083**	**0.109**	**0.192**	**0.017**	**0.100**	**0.118**	**293**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.
2. Results include mass site grading (land clearing) and worker trips, using the default settings of URBEMIS2007.

B.1-10 Site Preparation: Construction Emissions from Land Clearing

This tab provides the emissions resulting from land clearing by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
BNSF Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
UPRR Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
UPRR Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Hybrid Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Hybrid Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment	0.314	1.319	2.659	0.000	0.000	0.109	0.109	0.000	0.100	0.100	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF Ave 21 2013 Total [1]	**0.316**	**1.378**	**2.662**	**0.000**	**0.075**	**0.109**	**0.185**	**0.016**	**0.100**	**0.116**	**293**
BNSF Ave 24 2013 Total [1]	**0.316**	**1.378**	**2.662**	**0.000**	**0.075**	**0.109**	**0.185**	**0.016**	**0.100**	**0.116**	**293**
UPRR Ave 21 2013 Total [1]	**0.316**	**1.378**	**2.662**	**0.000**	**0.075**	**0.109**	**0.185**	**0.016**	**0.100**	**0.116**	**293**
UPRR Ave 24 2013 Total [1]	**0.316**	**1.378**	**2.662**	**0.000**	**0.075**	**0.109**	**0.185**	**0.016**	**0.100**	**0.116**	**293**
Hybrid Ave 24 2013 Total [1]	**0.316**	**1.378**	**2.662**	**0.000**	**0.075**	**0.109**	**0.185**	**0.016**	**0.100**	**0.116**	**293**
Hybrid Ave 21 2013 Total [1]	**0.316**	**1.378**	**2.662**	**0.000**	**0.075**	**0.109**	**0.185**	**0.016**	**0.100**	**0.116**	**293**

Notes:

1. Mitigation for fugitive dust was applied using URBEMIS2007 and included watering exposed surfaces 3x daily.

B.1-10 Site Preparation: Construction Emissions from Land Clearing

This tab provides the emissions resulting from land clearing by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
BNSF Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment [3]	0.114	1.319	0.295	0.000	0.000	0.011	0.011	0.000	0.010	0.010	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment [3]	0.114	1.319	0.295	0.000	0.000	0.011	0.011	0.000	0.010	0.010	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
UPRR Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment [3]	0.114	1.319	0.295	0.000	0.000	0.011	0.011	0.000	0.010	0.010	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
UPRR Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment [3]	0.114	1.319	0.295	0.000	0.000	0.011	0.011	0.000	0.010	0.010	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Hybrid Ave 24 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment [3]	0.114	1.319	0.295	0.000	0.000	0.011	0.011	0.000	0.010	0.010	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Hybrid Ave 21 Mass Grading / Land Clearing											
Dust	-	-	-	-	0.075	-	0.075	0.016	-	0.016	-
Off-Road Equipment [3]	0.114	1.319	0.295	0.000	0.000	0.011	0.011	0.000	0.010	0.010	286
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.059	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
BNSF Ave 21 2013 Total [4, 5]	**0.116**	**1.378**	**0.298**	**0.000**	**0.075**	**0.011**	**0.087**	**0.016**	**0.010**	**0.026**	**293**
BNSF Ave 24 2013 Total [4, 5]	**0.116**	**1.378**	**0.298**	**0.000**	**0.075**	**0.011**	**0.087**	**0.016**	**0.010**	**0.026**	**293**
UPRR Ave 21 2013 Total [4, 5]	**0.116**	**1.378**	**0.298**	**0.000**	**0.075**	**0.011**	**0.087**	**0.016**	**0.010**	**0.026**	**293**
UPRR Ave 24 2013 Total [4, 5]	**0.116**	**1.378**	**0.298**	**0.000**	**0.075**	**0.011**	**0.087**	**0.016**	**0.010**	**0.026**	**293**
Hybrid Ave 24 2013 Total [4, 5]	**0.116**	**1.378**	**0.298**	**0.000**	**0.075**	**0.011**	**0.087**	**0.016**	**0.010**	**0.026**	**293**
Hybrid Ave 21 2013 Total [4, 5]	**0.116**	**1.378**	**0.298**	**0.000**	**0.075**	**0.011**	**0.087**	**0.016**	**0.010**	**0.026**	**293**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading (land clearing) and worker trips, using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-11 BNSF Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the BNSF Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.082	-	0.082	0.017	-	0.017	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	19.219	-	19.219	4.014	-	4.014	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.017	-	0.017	0.004	-	0.004	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	57.657	-	57.657	12.041	-	12.041	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	38.217	-	38.217	7.981	-	7.981	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [2]	**0.573**	**2.676**	**4.649**	**0.000**	**19.302**	**0.214**	**19.516**	**4.031**	**0.197**	**4.228**	**524**
2014 Total [2]	**0.531**	**2.486**	**4.092**	**0.000**	**57.675**	**0.198**	**57.873**	**12.045**	**0.182**	**12.227**	**503**
2015 Total [2]	**0.197**	**0.960**	**1.517**	**0.000**	**38.217**	**0.070**	**38.288**	**7.981**	**0.065**	**8.046**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.

2. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007. Material hauling emissions during this phase are presented separately.

B.1-11 BNSF Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the BNSF Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	3.711	-	3.711	0.775	-	0.775	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	11.132	-	11.132	2.325	-	2.325	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	7.379	-	7.379	1.541	-	1.541	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [3]	**0.573**	**2.676**	**4.649**	**0.000**	**3.786**	**0.214**	**4.000**	**0.791**	**0.197**	**0.988**	**524**
2014 Total [3]	**0.531**	**2.486**	**4.092**	**0.000**	**11.149**	**0.198**	**11.348**	**2.329**	**0.182**	**2.511**	**503**
2015 Total [3]	**0.197**	**0.960**	**1.517**	**0.000**	**7.379**	**0.070**	**7.450**	**1.541**	**0.065**	**1.606**	**203**

Notes:

1. For all activities, fugitive dust emissions from offsite hauling were assumed to be negligible because vehicles travel on paved roads.
2. Additionally for the Cut & Fill activities, fugitive dust emissions from offsite hauling were assumed to be negligible by tarping haul trucks.
3. Mitigation for fugitive dust was applied using URBEMIS2007 and included watering exposed surfaces 3x daily.

B.1-11 BNSF Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the BNSF Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment [3]	0.166	2.040	0.416	0.000	0.000	0.017	0.017	0.000	0.016	0.016	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	3.711	-	3.711	0.775	-	0.775	-
Off-Road Equipment [3]	0.040	0.483	0.099	0.000	0.000	0.004	0.004	0.000	0.004	0.004	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment [3]	0.033	0.416	0.082	0.000	0.000	0.003	0.003	0.000	0.003	0.003	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	11.132	-	11.132	2.325	-	2.325	-
Off-Road Equipment [3]	0.114	1.401	0.276	0.000	0.000	0.012	0.012	0.000	0.011	0.011	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching (Utilities)											
Off-Road Equipment [3]	0.043	0.495	0.095	0.000	0.000	0.005	0.005	0.000	0.005	0.005	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	7.379	-	7.379	1.541	-	1.541	-
Off-Road Equipment [3]	0.071	0.899	0.168	0.000	0.000	0.007	0.007	0.000	0.007	0.007	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [4, 5]	**0.211**	**2.676**	**0.523**	**0.000**	**3.786**	**0.022**	**3.808**	**0.791**	**0.020**	**0.811**	**524**
2014 Total [4, 5]	**0.196**	**2.486**	**0.462**	**0.000**	**11.149**	**0.021**	**11.170**	**2.329**	**0.019**	**2.348**	**503**
2015 Total [4, 5]	**0.073**	**0.960**	**0.171**	**0.000**	**7.379**	**0.007**	**7.387**	**1.541**	**0.007**	**1.548**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-12 BNSF Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the BNSF Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.082	-	0.082	0.017	-	0.017	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	19.044	-	19.044	3.977	-	3.977	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.017	-	0.017	0.004	-	0.004	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	57.131	-	57.131	11.931	-	11.931	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	37.868	-	37.868	7.908	-	7.908	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [2]	**0.573**	**2.676**	**4.649**	**0.000**	**19.126**	**0.214**	**19.340**	**3.995**	**0.197**	**4.191**	**524**
2014 Total [2]	**0.531**	**2.486**	**4.092**	**0.000**	**57.149**	**0.198**	**57.347**	**11.935**	**0.182**	**12.117**	**503**
2015 Total [2]	**0.197**	**0.960**	**1.517**	**0.000**	**37.869**	**0.070**	**37.939**	**7.909**	**0.065**	**7.973**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.

2. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007. Material hauling emissions during this phase are presented separately.

B.1-12 BNSF Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the BNSF Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	3.677	-	3.677	0.768	-	0.768	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	11.032	-	11.032	2.304	-	2.304	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	7.312	-	7.312	1.527	-	1.527	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [3]	**0.573**	**2.676**	**4.649**	**0.000**	**3.753**	**0.214**	**3.966**	**0.784**	**0.197**	**0.980**	**524**
2014 Total [3]	**0.531**	**2.486**	**4.092**	**0.000**	**11.048**	**0.198**	**11.247**	**2.308**	**0.182**	**2.490**	**503**
2015 Total [3]	**0.197**	**0.960**	**1.517**	**0.000**	**7.313**	**0.070**	**7.383**	**1.527**	**0.065**	**1.592**	**203**

Notes:

1. For all activities, fugitive dust emissions from offsite hauling were assumed to be negligible because vehicles travel on paved roads.
2. For the Cut & Fill activities, fugitive dust emissions from offsite hauling were assumed to be negligible by tarping haul trucks.
3. Mitigation for fugitive dust was applied using URBEMIS2007 and included watering exposed surfaces 3x daily.

B.1-12 BNSF Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the BNSF Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment [3]	0.166	2.040	0.416	0.000	0.000	0.017	0.017	0.000	0.016	0.016	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	3.677	-	3.677	0.768	-	0.768	-
Off-Road Equipment [3]	0.040	0.483	0.099	0.000	0.000	0.004	0.004	0.000	0.004	0.004	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment [3]	0.033	0.416	0.082	0.000	0.000	0.003	0.003	0.000	0.003	0.003	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	11.032	-	11.032	2.304	-	2.304	-
Off-Road Equipment [3]	0.114	1.401	0.276	0.000	0.000	0.012	0.012	0.000	0.011	0.011	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching (Utilities)											
Off-Road Equipment [3]	0.043	0.495	0.095	0.000	0.000	0.005	0.005	0.000	0.005	0.005	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	7.312	-	7.312	1.527	-	1.527	-
Off-Road Equipment [3]	0.071	0.899	0.168	0.000	0.000	0.007	0.007	0.000	0.007	0.007	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [4, 5]	**0.211**	**2.676**	**0.523**	**0.000**	**3.753**	**0.022**	**3.775**	**0.784**	**0.020**	**0.804**	**524**
2014 Total [4, 5]	**0.196**	**2.486**	**0.462**	**0.000**	**11.048**	**0.021**	**11.069**	**2.308**	**0.019**	**2.326**	**503**
2015 Total [4, 5]	**0.073**	**0.960**	**0.171**	**0.000**	**7.313**	**0.007**	**7.320**	**1.527**	**0.007**	**1.534**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-13 UPRR Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the UPRR Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.082	-	0.082	0.017	-	0.017	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	14.172	-	14.172	2.960	-	2.960	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.017	-	0.017	0.004	-	0.004	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	42.516	-	42.516	8.879	-	8.879	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	28.181	-	28.181	5.885	-	5.885	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [2]	**0.573**	**2.676**	**4.649**	**0.000**	**14.255**	**0.214**	**14.469**	**2.977**	**0.197**	**3.174**	**524**
2014 Total [2]	**0.531**	**2.486**	**4.092**	**0.000**	**42.535**	**0.198**	**42.733**	**8.883**	**0.182**	**9.065**	**503**
2015 Total [2]	**0.197**	**0.960**	**1.517**	**0.000**	**28.182**	**0.070**	**28.252**	**5.886**	**0.065**	**5.950**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.

2. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007. Material hauling emissions during this phase are presented separately.

B.1-13 UPRR Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the UPRR Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	2.743	-	2.743	0.573	-	0.573	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	8.228	-	8.228	1.718	-	1.718	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	5.454	-	5.454	1.139	-	1.139	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [3]	**0.573**	**2.676**	**4.649**	**0.000**	**2.818**	**0.214**	**3.032**	**0.589**	**0.197**	**0.785**	**524**
2014 Total [3]	**0.531**	**2.486**	**4.092**	**0.000**	**8.244**	**0.198**	**8.443**	**1.722**	**0.182**	**1.904**	**503**
2015 Total [3]	**0.197**	**0.960**	**1.517**	**0.000**	**5.454**	**0.070**	**5.524**	**1.139**	**0.065**	**1.204**	**203**

Notes:

1. For all activities, fugitive dust emissions from offsite hauling were assumed to be negligible because vehicles travel on paved roads.
2. For the Cut & Fill activities, fugitive dust emissions from offsite hauling were assumed to be negligible by tarping haul trucks.
3. Mitigation for fugitive dust was applied using URBEMIS2007 and included watering exposed surfaces 3x daily.

B.1-13 UPRR Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the UPRR Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment [3]	0.166	2.040	0.416	0.000	0.000	0.017	0.017	0.000	0.016	0.016	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	2.743	-	2.743	0.573	-	0.573	-
Off-Road Equipment [3]	0.040	0.483	0.099	0.000	0.000	0.004	0.004	0.000	0.004	0.004	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment [3]	0.033	0.416	0.082	0.000	0.000	0.003	0.003	0.000	0.003	0.003	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	8.228	-	8.228	1.718	-	1.718	-
Off-Road Equipment [3]	0.114	1.401	0.276	0.000	0.000	0.012	0.012	0.000	0.011	0.011	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching (Utilities)											
Off-Road Equipment [3]	0.043	0.495	0.095	0.000	0.000	0.005	0.005	0.000	0.005	0.005	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	5.454	-	5.454	1.139	-	1.139	-
Off-Road Equipment [3]	0.071	0.899	0.168	0.000	0.000	0.007	0.007	0.000	0.007	0.007	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [4, 5]	**0.211**	**2.676**	**0.523**	**0.000**	**2.818**	**0.022**	**2.840**	**0.589**	**0.020**	**0.609**	**524**
2014 Total [4, 5]	**0.196**	**2.486**	**0.462**	**0.000**	**8.244**	**0.021**	**8.265**	**1.722**	**0.019**	**1.741**	**503**
2015 Total [4, 5]	**0.073**	**0.960**	**0.171**	**0.000**	**5.454**	**0.007**	**5.461**	**1.139**	**0.007**	**1.146**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-14 UPRR Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the UPRR Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.082	-	0.082	0.017	-	0.017	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	15.473	-	15.473	3.231	-	3.231	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.017	-	0.017	0.004	-	0.004	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	46.419	-	46.419	9.694	-	9.694	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	30.768	-	30.768	6.426	-	6.426	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [2]	**0.573**	**2.676**	**4.649**	**0.000**	**15.556**	**0.214**	**15.770**	**3.249**	**0.197**	**3.446**	**524**
2014 Total [2]	**0.531**	**2.486**	**4.092**	**0.000**	**46.438**	**0.198**	**46.636**	**9.698**	**0.182**	**9.881**	**503**
2015 Total [2]	**0.197**	**0.960**	**1.517**	**0.000**	**30.769**	**0.070**	**30.839**	**6.426**	**0.065**	**6.490**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.

2. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007. Material hauling emissions during this phase are presented separately.

B.1-14 UPRR Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the UPRR Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Fugitive Dust Mitigated)

	Emissions (tpy)										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2013 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	2.992	-	2.992	0.625	-	0.625	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	8.976	-	8.976	1.875	-	1.875	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	5.950	-	5.950	1.243	-	1.243	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [3]	**0.573**	**2.676**	**4.649**	**0.000**	**3.067**	**0.214**	**3.281**	**0.641**	**0.197**	**0.837**	**524**
2014 Total [3]	**0.531**	**2.486**	**4.092**	**0.000**	**8.993**	**0.198**	**9.191**	**1.878**	**0.182**	**2.061**	**503**
2015 Total [3]	**0.197**	**0.960**	**1.517**	**0.000**	**5.950**	**0.070**	**6.021**	**1.243**	**0.065**	**1.307**	**203**

Notes:

1. For all activities, fugitive dust emissions from offsite hauling were assumed to be negligible because vehicles travel on paved roads.
2. For the Cut & Fill activities, fugitive dust emissions from offsite hauling were assumed to be negligible by tarping haul trucks.
3. Mitigation for fugitive dust was applied using URBEMIS2007 and included watering exposed surfaces 3x daily.

B.1-14 UPRR Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the UPRR Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment [3]	0.166	2.040	0.416	0.000	0.000	0.017	0.017	0.000	0.016	0.016	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	2.992	-	2.992	0.625	-	0.625	-
Off-Road Equipment [3]	0.040	0.483	0.099	0.000	0.000	0.004	0.004	0.000	0.004	0.004	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment [3]	0.033	0.416	0.082	0.000	0.000	0.003	0.003	0.000	0.003	0.003	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	8.976	-	8.976	1.875	-	1.875	-
Off-Road Equipment [3]	0.114	1.401	0.276	0.000	0.000	0.012	0.012	0.000	0.011	0.011	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching (Utilities)											
Off-Road Equipment [3]	0.043	0.495	0.095	0.000	0.000	0.005	0.005	0.000	0.005	0.005	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	5.950	-	5.950	1.243	-	1.243	-
Off-Road Equipment [3]	0.071	0.899	0.168	0.000	0.000	0.007	0.007	0.000	0.007	0.007	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [4, 5]	**0.211**	**2.676**	**0.523**	**0.000**	**3.067**	**0.022**	**3.090**	**0.641**	**0.020**	**0.661**	**524**
2014 Total [4, 5]	**0.196**	**2.486**	**0.462**	**0.000**	**8.993**	**0.021**	**9.014**	**1.878**	**0.019**	**1.897**	**503**
2015 Total [4, 5]	**0.073**	**0.960**	**0.171**	**0.000**	**5.950**	**0.007**	**5.958**	**1.243**	**0.007**	**1.249**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-15 Hybrid Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the Hybrid Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.082	-	0.082	0.017	-	0.017	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	15.926	-	15.926	3.326	-	3.326	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.017	-	0.017	0.004	-	0.004	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	47.779	-	47.779	9.978	-	9.978	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	31.669	-	31.669	6.614	-	6.614	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [2]	**0.573**	**2.676**	**4.649**	**0.000**	**16.009**	**0.214**	**16.223**	**3.343**	**0.197**	**3.540**	**524**
2014 Total [2]	**0.531**	**2.486**	**4.092**	**0.000**	**47.797**	**0.198**	**47.995**	**9.982**	**0.182**	**10.164**	**503**
2015 Total [2]	**0.197**	**0.960**	**1.517**	**0.000**	**31.670**	**0.070**	**31.740**	**6.614**	**0.065**	**6.679**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.

2. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007. Material hauling emissions during this phase are presented separately.

B.1-15 Hybrid Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the Hybrid Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	3.079	-	3.079	0.643	-	0.643	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	9.237	-	9.237	1.929	-	1.929	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	6.123	-	6.123	1.279	-	1.279	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [3]	**0.573**	**2.676**	**4.649**	**0.000**	**3.154**	**0.214**	**3.368**	**0.659**	**0.197**	**0.856**	**524**
2014 Total [3]	**0.531**	**2.486**	**4.092**	**0.000**	**9.254**	**0.198**	**9.452**	**1.933**	**0.182**	**2.115**	**503**
2015 Total [3]	**0.197**	**0.960**	**1.517**	**0.000**	**6.123**	**0.070**	**6.193**	**1.279**	**0.065**	**1.343**	**203**

Notes:

1. For all activities, fugitive dust emissions from offsite hauling were assumed to be negligible because vehicles travel on paved roads.
2. For the Cut & Fill activities, fugitive dust emissions from offsite hauling were assumed to be negligible by tarping haul trucks.
3. Mitigation for fugitive dust was applied using URBEMIS2007 and included watering exposed surfaces 3x daily.

B.1-15 Hybrid Ave 24: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the Hybrid Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment [3]	0.166	2.040	0.416	0.000	0.000	0.017	0.017	0.000	0.016	0.016	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	3.079	-	3.079	0.643	-	0.643	-
Off-Road Equipment [3]	0.040	0.483	0.099	0.000	0.000	0.004	0.004	0.000	0.004	0.004	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment [3]	0.033	0.416	0.082	0.000	0.000	0.003	0.003	0.000	0.003	0.003	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	9.237	-	9.237	1.929	-	1.929	-
Off-Road Equipment [3]	0.114	1.401	0.276	0.000	0.000	0.012	0.012	0.000	0.011	0.011	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching (Utilities)											
Off-Road Equipment [3]	0.043	0.495	0.095	0.000	0.000	0.005	0.005	0.000	0.005	0.005	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	6.123	-	6.123	1.279	-	1.279	-
Off-Road Equipment [3]	0.071	0.899	0.168	0.000	0.000	0.007	0.007	0.000	0.007	0.007	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [4, 5]	**0.211**	**2.676**	**0.523**	**0.000**	**3.154**	**0.022**	**3.177**	**0.659**	**0.020**	**0.679**	**524**
2014 Total [4, 5]	**0.196**	**2.486**	**0.462**	**0.000**	**9.254**	**0.021**	**9.275**	**1.933**	**0.019**	**1.952**	**503**
2015 Total [4, 5]	**0.073**	**0.960**	**0.171**	**0.000**	**6.123**	**0.007**	**6.131**	**1.279**	**0.007**	**1.286**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-16 Hybrid Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the Hybrid Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.082	-	0.082	0.017	-	0.017	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	15.857	-	15.857	3.312	-	3.312	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.017	-	0.017	0.004	-	0.004	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	47.570	-	47.570	9.935	-	9.935	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	31.531	-	31.531	6.585	-	6.585	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [2]	**0.573**	**2.676**	**4.649**	**0.000**	**15.940**	**0.214**	**16.154**	**3.329**	**0.197**	**3.526**	**524**
2014 Total [2]	**0.531**	**2.486**	**4.092**	**0.000**	**47.589**	**0.198**	**47.787**	**9.939**	**0.182**	**10.121**	**503**
2015 Total [2]	**0.197**	**0.960**	**1.517**	**0.000**	**31.532**	**0.070**	**31.602**	**6.585**	**0.065**	**6.650**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.

2. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007. Material hauling emissions during this phase are presented separately.

B.1-16 Hybrid Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the Hybrid Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment	0.457	2.040	3.747	0.000	0.000	0.170	0.170	0.000	0.157	0.157	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	3.066	-	3.066	0.640	-	0.640	-
Off-Road Equipment	0.111	0.483	0.894	0.000	0.000	0.043	0.043	0.000	0.039	0.039	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust [1]	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment	0.092	0.416	0.737	0.000	0.000	0.033	0.033	0.000	0.030	0.030	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	9.197	-	9.197	1.921	-	1.921	-
Off-Road Equipment	0.315	1.401	2.490	0.000	0.000	0.116	0.116	0.000	0.106	0.106	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching											
Off-Road Equipment	0.119	0.495	0.857	0.000	0.000	0.049	0.049	0.000	0.045	0.045	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust [1, 2]	-	-	-	-	6.096	-	6.096	1.273	-	1.273	-
Off-Road Equipment	0.195	0.899	1.514	0.000	0.000	0.070	0.070	0.000	0.064	0.064	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [3]	**0.573**	**2.676**	**4.649**	**0.000**	**3.141**	**0.214**	**3.355**	**0.656**	**0.197**	**0.853**	**524**
2014 Total [3]	**0.531**	**2.486**	**4.092**	**0.000**	**9.214**	**0.198**	**9.412**	**1.924**	**0.182**	**2.107**	**503**
2015 Total [3]	**0.197**	**0.960**	**1.517**	**0.000**	**6.097**	**0.070**	**6.167**	**1.273**	**0.065**	**1.338**	**203**

Notes:

1. For all activities, fugitive dust emissions from offsite hauling were assumed to be negligible because vehicles travel on paved roads.
2. For the Cut & Fill activities, fugitive dust emissions from offsite hauling were assumed to be negligible by tarping haul trucks.
3. Mitigation for fugitive dust was applied using URBEMIS2007 and included watering exposed surfaces 3x daily.

B.1-16 Hybrid Ave 21: Construction Emissions from Earth Moving

This tab provides the emissions resulting from earth moving for the Hybrid Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Land Prep Equipment' tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.074	-	0.074	0.016	-	0.016	-
Off-Road Equipment [3]	0.166	2.040	0.416	0.000	0.000	0.017	0.017	0.000	0.016	0.016	407
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.116	0.006	0.000	0.001	0.000	0.001	0.000	0.000	0.001	14
Mass Grading / Cut & Fill											
Dust	-	-	-	-	3.066	-	3.066	0.640	-	0.640	-
Off-Road Equipment [3]	0.040	0.483	0.099	0.000	0.000	0.004	0.004	0.000	0.004	0.004	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.037	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2014 Construction											
Mass Grading / Grading											
Dust	-	-	-	-	0.016	-	0.016	0.003	-	0.003	-
Off-Road Equipment [3]	0.033	0.416	0.082	0.000	0.000	0.003	0.003	0.000	0.003	0.003	86
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Mass Grading / Cut & Fill											
Dust	-	-	-	-	9.197	-	9.197	1.921	-	1.921	-
Off-Road Equipment [3]	0.114	1.401	0.276	0.000	0.000	0.012	0.012	0.000	0.011	0.011	293
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.101	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	13
Trenching (Utilities)											
Off-Road Equipment [3]	0.043	0.495	0.095	0.000	0.000	0.005	0.005	0.000	0.005	0.005	101
Worker Trips	0.002	0.050	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Construction											
Mass Grading / Cut & Fill											
Dust	-	-	-	-	6.096	-	6.096	1.273	-	1.273	-
Off-Road Equipment [3]	0.071	0.899	0.168	0.000	0.000	0.007	0.007	0.000	0.007	0.007	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.061	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2013 Total [4, 5]	**0.211**	**2.676**	**0.523**	**0.000**	**3.141**	**0.022**	**3.163**	**0.656**	**0.020**	**0.676**	**524**
2014 Total [4, 5]	**0.196**	**2.486**	**0.462**	**0.000**	**9.214**	**0.021**	**9.235**	**1.924**	**0.019**	**1.943**	**503**
2015 Total [4, 5]	**0.073**	**0.960**	**0.171**	**0.000**	**6.097**	**0.007**	**6.104**	**1.273**	**0.007**	**1.280**	**203**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading (Grading), mass site grading (Cut & Fill), and trenching. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-17 Roadways: Construction Emissions for 1-Year Duration Structures

This tab provides data for Roadway Projects (Structures) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Land Clearing [2]											
Dust	-	-	-	-	0.020	-	0.020	0.004	-	0.004	-
Off-Road Equipment	0.047	0.183	0.405	0.000	0.000	0.016	0.016	0.000	0.014	0.014	44
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Mass Grading / Grading [2]											
Dust	-	-	-	-	0.078	-	0.078	0.016	-	0.016	-
Off-Road Equipment	0.241	1.013	2.009	0.000	0.000	0.090	0.090	0.000	0.083	0.083	238
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.067	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Mass Grading / Utilities [2]											
Dust	-	-	-	-	0.017	-	0.017	0.003	-	0.003	-
Off-Road Equipment	0.039	0.153	0.314	0.000	0.000	0.015	0.015	0.000	0.014	0.014	35
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.012	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2014 Construction											
Mass Grading / Utilities [2]											
Dust	-	-	-	-	0.053	-	0.053	0.011	-	0.011	-
Off-Road Equipment	0.119	0.470	0.928	0.000	0.000	0.045	0.045	0.000	0.041	0.041	111
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.034	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
Asphalt Paving											
Off-Gas	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.033	0.132	0.205	0.000	0.000	0.018	0.018	0.000	0.016	0.016	19
On-Road Equipment	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2013 Total [3, 4]	**0.330**	**1.434**	**2.733**	**0.000**	**0.115**	**0.121**	**0.236**	**0.024**	**0.111**	**0.135**	**328**
2014 Total [3, 4]	**0.154**	**0.648**	**1.136**	**0.000**	**0.053**	**0.063**	**0.116**	**0.011**	**0.058**	**0.069**	**136**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output. Structures modeled are constructed in less than 1 year.
2. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
3. Results include emissions from paving activities and 3 mass site grading phases representing the following construction activities: grubbing / land clearing, grading / excavation, and drainage / utilities / sub-grade. Worker trips are also included using the default settings of URBEMIS2007.
4. URBEMIS2007 defaults for equipment counts and equipment hours/day were overwritten with numbers estimated by the Road Construction Emissions Model. The schedule was also set equal to that estimated by the Roadway Construction Emissions Model.

B.1-17 Roadways: Construction Emissions for 1-Year Duration Structures

This tab provides data for Roadway Projects (Structures) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
Mass Grading / Land Clearing [1]											
Dust	-	-	-	-	0.0178	-	0.0178	0.0037	-	0.0037	-
Off-Road Equipment	0.0468	0.1826	0.4050	0.0000	0.0000	0.0157	0.0157	0.0000	0.0145	0.0145	44
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0003	0.0083	0.0004	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	1
Mass Grading / Grading [1]											
Dust	-	-	-	-	0.071	-	0.071	0.015	-	0.015	-
Off-Road Equipment	0.241	1.013	2.009	0.000	0.000	0.090	0.090	0.000	0.083	0.083	238
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.067	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Mass Grading / Utilities [1]											
Dust	-	-	-	-	0.0150	-	0.0150	0.0031	-	0.0031	-
Off-Road Equipment	0.0392	0.1526	0.3143	0.0000	0.0000	0.0154	0.0154	0.0000	0.0141	0.0141	35
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0004	0.0117	0.0006	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0001	1
2014 Construction											
Mass Grading / Utilities [1]											
Dust	-	-	-	-	0.0478	-	0.0478	0.0100	-	0.0100	-
Off-Road Equipment	0.1188	0.4703	0.9277	0.0000	0.0000	0.0447	0.0447	0.0000	0.0411	0.0411	111
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0010	0.0340	0.0017	0.0000	0.0002	0.0001	0.0003	0.0001	0.0001	0.0002	4
Asphalt Paving											
Off-Gas	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.033	0.132	0.205	0.000	0.000	0.018	0.018	0.000	0.016	0.016	19
On-Road Equipment	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2013 Total [2]	**0.330**	**1.434**	**2.733**	**0.000**	**0.104**	**0.121**	**0.225**	**0.022**	**0.111**	**0.133**	**328**
2014 Total [2]	**0.154**	**0.648**	**1.136**	**0.000**	**0.048**	**0.063**	**0.111**	**0.010**	**0.058**	**0.068**	**136**

Notes:

1. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
2. Mitigation for fugitive dust included watering exposed surfaces 3x daily and was applied using URBEMIS2007.

B.1-17 Roadways: Construction Emissions for 1-Year Duration Structures

This tab provides data for Roadway Projects (Structures) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2013 Construction											
Mass Grading / Land Clearing [3]											
Dust	-	-	-	-	0.018	-	0.018	0.004	-	0.004	-
Off-Road Equipment [4]	0.017	0.183	0.045	0.000	0.000	0.002	0.002	0.000	0.001	0.001	44
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Mass Grading / Grading [3]											
Dust	-	-	-	-	0.071	-	0.071	0.015	-	0.015	-
Off-Road Equipment [4]	0.087	1.013	0.223	0.000	0.000	0.009	0.009	0.000	0.008	0.008	238
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.067	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Mass Grading / Utilities [3]											
Dust	-	-	-	-	0.015	-	0.015	0.003	-	0.003	-
Off-Road Equipment [4]	0.014	0.153	0.035	0.000	0.000	0.002	0.002	0.000	0.001	0.001	35
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.012	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2014 Construction											
Mass Grading / Utilities [3]											
Dust	-	-	-	-	0.048	-	0.048	0.010	-	0.010	-
Off-Road Equipment [4]	0.043	0.470	0.103	0.000	0.000	0.005	0.005	0.000	0.004	0.004	111
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.034	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
Asphalt Paving											
Off-Gas	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment [4]	0.012	0.132	0.023	0.000	0.000	0.002	0.002	0.000	0.002	0.002	19
On-Road Equipment	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2013 Total [5, 6, 7]	**0.121**	**1.434**	**0.307**	**0.000**	**0.104**	**0.013**	**0.117**	**0.022**	**0.011**	**0.033**	**328**
2014 Total [5, 6, 7]	**0.057**	**0.648**	**0.130**	**0.000**	**0.048**	**0.007**	**0.055**	**0.010**	**0.006**	**0.016**	**136**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category. Structures modeled are constructed in less than 1 year.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
4. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
5. Results include emissions from paving activities and 3 mass site grading phases representing the following construction activities: grubbing / land clearing, grading / excavation, and drainage / utilities / sub-grade. Worker trips are also included using the default settings of URBEMIS2007.
6. URBEMIS2007 defaults for equipment counts and equipment hours/day were overwritten with numbers estimated by the Road Construction Emissions Model. The schedule was also set equal to that estimated by the Roadway Construction Emissions Model.
7. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-18 Roadways: Construction Emissions for 2.5-Year Duration Road Modifications

This tab provides data for Roadway Projects (> 2.5 miles) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2014 Construction											
Mass Grading / Land Clearing [2]											
Dust	-	-	-	-	0.049	-	0.049	0.010	-	0.010	-
Off-Road Equipment	0.155	0.660	1.210	0.000	0.000	0.047	0.047	0.000	0.043	0.043	148
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.095	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	12
Mass Grading / Grading [2]											
Dust	-	-	-	-	0.066	-	0.066	0.014	-	0.014	-
Off-Road Equipment	0.226	1.053	1.707	0.000	0.000	0.074	0.074	0.000	0.068	0.068	220
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.145	0.007	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2015 Construction											
Mass Grading / Grading [2]											
Dust	-	-	-	-	0.130	-	0.130	0.027	-	0.027	-
Off-Road Equipment	0.422	2.037	3.116	0.000	0.000	0.137	0.137	0.000	0.126	0.126	432
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.260	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.002	38
Mass Grading / Utilities [2]											
Dust	-	-	-	-	0.066	-	0.066	0.014	-	0.014	-
Off-Road Equipment	0.199	0.884	1.441	0.000	0.000	0.066	0.066	0.000	0.061	0.061	191
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.132	0.007	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2016 Construction											
Mass Grading / Utilities [2]											
Dust	-	-	-	-	0.106	-	0.106	0.022	-	0.022	-
Off-Road Equipment	0.307	1.394	2.167	0.000	0.000	0.099	0.099	0.000	0.091	0.091	306
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.006	0.193	0.010	0.000	0.001	0.001	0.002	0.001	0.001	0.001	31
Asphalt Paving											
Off-Gas	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.141	0.680	0.876	0.000	0.000	0.054	0.054	0.000	0.050	0.050	104
On-Road Equipment	0.006	0.028	0.076	0.000	0.001	0.003	0.004	0.000	0.003	0.003	21
Worker Trips	0.003	0.119	0.006	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2014 Total [3, 4]	**0.388**	**1.952**	**2.929**	**0.000**	**0.117**	**0.122**	**0.239**	**0.025**	**0.112**	**0.137**	**400**
2015 Total [3, 4]	**0.633**	**3.313**	**4.577**	**0.001**	**0.199**	**0.205**	**0.404**	**0.042**	**0.188**	**0.230**	**680**
2016 Total [3, 4]	**0.509**	**2.415**	**3.134**	**0.001**	**0.109**	**0.158**	**0.267**	**0.023**	**0.145**	**0.168**	**481**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output. Projects modeled are more than 2.5 miles in length.
2. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
3. Results include emissions from paving activities and 3 mass site grading phases representing the following construction activities: grubbing / land clearing, grading / excavation, and drainage / utilities / sub-grade. Worker trips are also included using the default settings of URBEMIS2007.
4. URBEMIS2007 defaults for equipment counts and equipment hours/day were overwritten with numbers estimated by the Road Construction Emissions Model. The schedule was also set equal to that estimated by the Roadway Construction Emissions Model.

B.1-18 Roadways: Construction Emissions for 2.5-Year Duration Road Modifications

This tab provides data for Roadway Projects (> 2.5 miles) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2014 Construction											
Mass Grading / Land Clearing [1]											
Dust	-	-	-	-	0.0444	-	0.0444	0.0093	-	0.0093	-
Off-Road Equipment	0.1549	0.6597	1.2103	0.0000	0.0000	0.0467	0.0467	0.0000	0.0430	0.0430	148
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0029	0.0946	0.0049	0.0001	0.0006	0.0004	0.0010	0.0002	0.0003	0.0005	12
Mass Grading / Grading [1]											
Dust	-	-	-	-	0.060	-	0.060	0.013	-	0.013	-
Off-Road Equipment	0.226	1.053	1.707	0.000	0.000	0.074	0.074	0.000	0.068	0.068	220
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.145	0.007	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2015 Construction											
Mass Grading / Grading [1]											
Dust	-	-	-	-	0.1182	-	0.1182	0.0247	-	0.0247	-
Off-Road Equipment	0.4225	2.0370	3.1161	0.0000	0.0000	0.1370	0.1370	0.0000	0.1261	0.1261	432
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0077	0.2597	0.0132	0.0004	0.0018	0.0011	0.0029	0.0007	0.0009	0.0015	38
Mass Grading / Utilities [1]											
Dust	-	-	-	-	0.060	-	0.060	0.013	-	0.013	-
Off-Road Equipment	0.199	0.884	1.441	0.000	0.000	0.066	0.066	0.000	0.061	0.061	191
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.132	0.007	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2016 Construction											
Mass Grading / Utilities [1]											
Dust	-	-	-	-	0.0963	-	0.0963	0.0201	-	0.0201	-
Off-Road Equipment	0.3069	1.3944	2.1669	0.0000	0.0000	0.0991	0.0991	0.0000	0.0912	0.0912	306
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0057	0.1933	0.0097	0.0003	0.0015	0.0009	0.0024	0.0005	0.0007	0.0012	31
Asphalt Paving											
Off-Gas	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.141	0.680	0.876	0.000	0.000	0.054	0.054	0.000	0.050	0.050	104
On-Road Equipment	0.006	0.028	0.076	0.000	0.001	0.003	0.004	0.000	0.003	0.003	21
Worker Trips	0.003	0.119	0.006	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2014 Total [2]	**0.388**	**1.952**	**2.929**	**0.000**	**0.106**	**0.122**	**0.228**	**0.022**	**0.112**	**0.135**	**400**
2015 Total [2]	**0.633**	**3.313**	**4.577**	**0.001**	**0.181**	**0.205**	**0.386**	**0.038**	**0.188**	**0.227**	**680**
2016 Total [2]	**0.509**	**2.415**	**3.134**	**0.001**	**0.099**	**0.158**	**0.257**	**0.021**	**0.145**	**0.166**	**481**

Notes:

1. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
2. Mitigation for fugitive dust included watering exposed surfaces 3x daily and was applied using URBEMIS2007.

B.1-18 Roadways: Construction Emissions for 2.5-Year Duration Road Modifications

This tab provides data for Roadway Projects (> 2.5 miles) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2014 Construction											
Mass Grading / Land Clearing [3]											
Dust	-	-	-	-	0.044	-	0.044	0.009	-	0.009	-
Off-Road Equipment [4]	0.056	0.660	0.134	0.000	0.000	0.005	0.005	0.000	0.004	0.004	148
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.095	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	12
Mass Grading / Grading [3]											
Dust	-	-	-	-	0.060	-	0.060	0.013	-	0.013	-
Off-Road Equipment [4]	0.082	1.053	0.189	0.000	0.000	0.008	0.008	0.000	0.007	0.007	220
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.145	0.007	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2015 Construction											
Mass Grading / Grading [3]											
Dust	-	-	-	-	0.118	-	0.118	0.025	-	0.025	-
Off-Road Equipment [4]	0.153	2.037	0.346	0.000	0.000	0.014	0.014	0.000	0.013	0.013	432
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.260	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.002	38
Mass Grading / Utilities [3]											
Dust	-	-	-	-	0.060	-	0.060	0.013	-	0.013	-
Off-Road Equipment [4]	0.072	0.884	0.160	0.000	0.000	0.007	0.007	0.000	0.006	0.006	191
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.132	0.007	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2016 Construction											
Mass Grading / Utilities [3]											
Dust	-	-	-	-	0.096	-	0.096	0.020	-	0.020	-
Off-Road Equipment [4]	0.111	1.394	0.241	0.000	0.000	0.010	0.010	0.000	0.009	0.009	306
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.006	0.193	0.010	0.000	0.001	0.001	0.002	0.001	0.001	0.001	31
Asphalt Paving											
Off-Gas	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment [4]	0.051	0.680	0.097	0.000	0.000	0.006	0.006	0.000	0.005	0.005	104
On-Road Equipment	0.006	0.028	0.076	0.000	0.001	0.003	0.004	0.000	0.003	0.003	21
Worker Trips	0.003	0.119	0.006	0.000	0.001	0.001	0.001	0.000	0.000	0.001	19
2014 Total [5, 6, 7]	**0.145**	**1.952**	**0.336**	**0.000**	**0.106**	**0.013**	**0.119**	**0.022**	**0.012**	**0.034**	**400**
2015 Total [5, 6, 7]	**0.237**	**3.313**	**0.526**	**0.001**	**0.181**	**0.022**	**0.203**	**0.038**	**0.020**	**0.058**	**680**
2016 Total [5, 6, 7]	**0.223**	**2.415**	**0.429**	**0.001**	**0.099**	**0.020**	**0.119**	**0.021**	**0.018**	**0.039**	**481**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category. Projects modeled are more than 2.5 miles in length.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
4. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
5. Results include emissions from paving activities and 3 mass site grading phases representing the following construction activities: grubbing / land clearing, grading / excavation, and drainage / utilities / sub-grade. Worker trips are also included using the default settings of URBEMIS2007.
6. URBEMIS2007 defaults for equipment counts and equipment hours/day were overwritten with numbers estimated by the Road Construction Emissions Model. The schedule was also set equal to that estimated by the Roadway Construction Emissions Model.
7. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-19 Roadways: Construction Emissions for 2-Year Duration Road Modifications

This tab provides data for Roadway Projects (< 2.5 miles) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2015 Construction											
Mass Grading / Land Clearing [2]											
Dust	-	-	-	-	0.039	-	0.039	0.008	-	0.008	-
Off-Road Equipment	0.096	0.385	0.765	0.000	0.000	0.029	0.029	0.000	0.027	0.027	99
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.032	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Mass Grading / Grading [2]											
Dust	-	-	-	-	0.157	-	0.157	0.033	-	0.033	-
Off-Road Equipment	0.417	1.970	3.179	0.000	0.000	0.143	0.143	0.000	0.132	0.132	442
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.166	0.008	0.000	0.001	0.001	0.002	0.000	0.001	0.001	24
2016 Construction											
Mass Grading / Utilities [2]											
Dust	-	-	-	-	0.139	-	0.139	0.029	-	0.029	-
Off-Road Equipment	0.319	1.387	2.312	0.000	0.000	0.110	0.110	0.000	0.101	0.101	328
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.134	0.007	0.000	0.001	0.001	0.002	0.000	0.000	0.001	21
Asphalt Paving											
Off-Gas	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.076	0.353	0.472	0.000	0.000	0.034	0.034	0.000	0.032	0.032	52
On-Road Equipment	0.002	0.009	0.025	0.000	0.000	0.001	0.001	0.000	0.001	0.001	7
Worker Trips	0.001	0.043	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Total [3, 4]	**0.519**	**2.553**	**3.954**	**0.000**	**0.198**	**0.173**	**0.371**	**0.042**	**0.159**	**0.201**	**569**
2016 Total [3, 4]	**0.417**	**1.927**	**2.817**	**0.000**	**0.140**	**0.146**	**0.286**	**0.029**	**0.134**	**0.163**	**416**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output. Projects modeled are less than 2.5 miles in length.
2. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
3. Results include emissions from paving activities and 3 mass site grading phases representing the following construction activities: grubbing / land clearing, grading / excavation, and drainage / utilities / sub-grade. Worker trips are also included using the default settings of URBEMIS2007.
4. URBEMIS2007 defaults for equipment counts and equipment hours/day were overwritten with numbers estimated by the Road Construction Emissions Model. The schedule was also set equal to that estimated by the Roadway Construction Emissions Model.

B.1-19 Roadways: Construction Emissions for 2-Year Duration Road Modifications

This tab provides data for Roadway Projects (< 2.5 miles) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2015 Construction											
Mass Grading / Land Clearing [1]											
Dust	-	-	-	-	0.0355	-	0.0355	0.0074	-	0.0074	-
Off-Road Equipment	0.0959	0.3852	0.7650	0.0000	0.0000	0.0294	0.0294	0.0000	0.0270	0.0270	99
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0010	0.0321	0.0016	0.0000	0.0002	0.0001	0.0004	0.0001	0.0001	0.0002	5
Mass Grading / Grading [1]											
Dust	-	-	-	-	0.143	-	0.143	0.030	-	0.030	-
Off-Road Equipment	0.417	1.970	3.179	0.000	0.000	0.143	0.143	0.000	0.132	0.132	442
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.166	0.008	0.000	0.001	0.001	0.002	0.000	0.001	0.001	24
2016 Construction											
Mass Grading / Utilities [1]											
Dust	-	-	-	-	0.1257	-	0.1257	0.0262	-	0.0262	-
Off-Road Equipment	0.3185	1.3871	2.3118	0.0000	0.0000	0.1096	0.1096	0.0000	0.1008	0.1008	328
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0039	0.1336	0.0067	0.0002	0.0010	0.0006	0.0016	0.0004	0.0005	0.0009	21
Asphalt Paving											
Off-Gas	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.076	0.353	0.472	0.000	0.000	0.034	0.034	0.000	0.032	0.032	52
On-Road Equipment	0.002	0.009	0.025	0.000	0.000	0.001	0.001	0.000	0.001	0.001	7
Worker Trips	0.001	0.043	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Total [2]	**0.519**	**2.553**	**3.954**	**0.000**	**0.180**	**0.173**	**0.353**	**0.038**	**0.159**	**0.197**	**569**
2016 Total [2]	**0.417**	**1.927**	**2.817**	**0.000**	**0.127**	**0.146**	**0.273**	**0.027**	**0.134**	**0.161**	**416**

Notes:

1. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
2. Mitigation for fugitive dust included watering exposed surfaces 3x daily and was applied using URBEMIS2007.

B.1-19 Roadways: Construction Emissions for 2-Year Duration Road Modifications

This tab provides data for Roadway Projects (< 2.5 miles) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2015 Construction											
Mass Grading / Land Clearing [3]											
Dust	-	-	-	-	0.036	-	0.036	0.007	-	0.007	-
Off-Road Equipment [4]	0.035	0.385	0.085	0.000	0.000	0.003	0.003	0.000	0.003	0.003	99
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.032	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5
Mass Grading / Grading [3]											
Dust	-	-	-	-	0.143	-	0.143	0.030	-	0.030	-
Off-Road Equipment [4]	0.151	1.970	0.353	0.000	0.000	0.015	0.015	0.000	0.013	0.013	442
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.166	0.008	0.000	0.001	0.001	0.002	0.000	0.001	0.001	24
2016 Construction											
Mass Grading / Utilities [3]											
Dust	-	-	-	-	0.126	-	0.126	0.026	-	0.026	-
Off-Road Equipment [4]	0.115	1.387	0.257	0.000	0.000	0.011	0.011	0.000	0.010	0.010	328
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.004	0.134	0.007	0.000	0.001	0.001	0.002	0.000	0.000	0.001	21
Asphalt Paving											
Off-Gas	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment [4]	0.028	0.353	0.052	0.000	0.000	0.003	0.003	0.000	0.003	0.003	52
On-Road Equipment	0.002	0.009	0.025	0.000	0.000	0.001	0.001	0.000	0.001	0.001	7
Worker Trips	0.001	0.043	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2015 Total [5, 6, 7]	**0.192**	**2.553**	**0.448**	**0.000**	**0.180**	**0.018**	**0.198**	**0.038**	**0.017**	**0.054**	**569**
2016 Total [5, 6, 7]	**0.165**	**1.927**	**0.342**	**0.000**	**0.127**	**0.016**	**0.144**	**0.027**	**0.015**	**0.042**	**416**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category. Projects modeled are less than 2.5 miles in length.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
4. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
5. Results include emissions from paving activities and 3 mass site grading phases representing the following construction activities: grubbing / land clearing, grading / excavation, and drainage / utilities / sub-grade. Worker trips are also included using the default settings of URBEMIS2007.
6. URBEMIS2007 defaults for equipment counts and equipment hours/day were overwritten with numbers estimated by the Road Construction Emissions Model. The schedule was also set equal to that estimated by the Roadway Construction Emissions Model.
7. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-20 Roadways: Construction Emissions for 1-Year Duration Road Modifications

This tab provides data for Roadway Projects (< 1 mile) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2017 Construction											
Mass Grading / Land Clearing [2]											
Dust	-	-	-	-	0.020	-	0.020	0.004	-	0.004	-
Off-Road Equipment	0.041	0.159	0.315	0.000	0.000	0.012	0.012	0.000	0.011	0.011	47
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Mass Grading / Grading [2]											
Dust	-	-	-	-	0.078	-	0.078	0.016	-	0.016	-
Off-Road Equipment	0.168	0.848	1.203	0.000	0.000	0.054	0.054	0.000	0.049	0.049	203
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.046	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Mass Grading / Utilities [2]											
Dust	-	-	-	-	0.069	-	0.069	0.014	-	0.014	-
Off-Road Equipment	0.136	0.597	0.971	0.000	0.000	0.047	0.047	0.000	0.043	0.043	151
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.041	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Asphalt Paving											
Off-Gas	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.030	0.140	0.182	0.000	0.000	0.014	0.014	0.000	0.013	0.013	20
On-Road Equipment	0.000	0.002	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2
2017 Total [3, 4]	**0.382**	**1.851**	**2.680**	**0.000**	**0.168**	**0.128**	**0.296**	**0.035**	**0.117**	**0.153**	**441**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output. Projects modeled are less than 1 mile in length.
2. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
3. Results include emissions from paving activities and 3 mass site grading phases representing the following construction activities: grubbing / land clearing, grading / excavation, and drainage / utilities / sub-grade. Worker trips are also included using the default settings of URBEMIS2007.
4. URBEMIS2007 defaults for equipment counts and equipment hours/day were overwritten with numbers estimated by the Road Construction Emissions Model. The schedule was also set equal to that estimated by the Roadway Construction Emissions Model.

B.1-20 Roadways: Construction Emissions for 1-Year Duration Road Modifications

This tab provides data for Roadway Projects (< 1 mile) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Fugitive Dust Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2017 Construction											
Mass Grading / Land Clearing [1]											
Dust	-	-	-	-	0.0184	-	0.0184	0.0039	-	0.0039	-
Off-Road Equipment	0.0412	0.1587	0.3149	0.0000	0.0000	0.0124	0.0124	0.0000	0.0114	0.0114	47
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0002	0.0080	0.0004	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000	0.0001	1
Mass Grading / Grading [1]											
Dust	-	-	-	-	0.070	-	0.070	0.015	-	0.015	-
Off-Road Equipment	0.168	0.848	1.203	0.000	0.000	0.054	0.054	0.000	0.049	0.049	203
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.046	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Mass Grading / Utilities [1]											
Dust	-	-	-	-	0.0628	-	0.0628	0.0131	-	0.0131	-
Off-Road Equipment	0.1362	0.5973	0.9709	0.0000	0.0000	0.0469	0.0469	0.0000	0.0431	0.0431	151
On-Road Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0
Worker Trips	0.0012	0.0407	0.0020	0.0001	0.0003	0.0002	0.0005	0.0001	0.0002	0.0003	7
Asphalt Paving											
Off-Gas	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.030	0.140	0.182	0.000	0.000	0.014	0.014	0.000	0.013	0.013	20
On-Road Equipment	0.000	0.002	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2
2017 Total [2]	**0.382**	**1.851**	**2.680**	**0.000**	**0.153**	**0.128**	**0.280**	**0.032**	**0.117**	**0.149**	**441**

Notes:

1. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
2. Mitigation for fugitive dust included watering exposed surfaces 3x daily and was applied using URBEMIS2007.

B.1-20 Roadways: Construction Emissions for 1-Year Duration Road Modifications

This tab provides data for Roadway Projects (< 1 mile) that will be scaled on the Alternative Roadways tabs. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2017 Construction											
Mass Grading / Land Clearing [3]											
Dust	-	-	-	-	0.018	-	0.018	0.004	-	0.004	-
Off-Road Equipment [4]	0.015	0.159	0.035	0.000	0.000	0.001	0.001	0.000	0.001	0.001	47
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Mass Grading / Grading [3]											
Dust	-	-	-	-	0.070	-	0.070	0.015	-	0.015	-
Off-Road Equipment [4]	0.061	0.848	0.133	0.000	0.000	0.005	0.005	0.000	0.005	0.005	203
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.046	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Mass Grading / Utilities [3]											
Dust	-	-	-	-	0.063	-	0.063	0.013	-	0.013	-
Off-Road Equipment [4]	0.049	0.597	0.108	0.000	0.000	0.005	0.005	0.000	0.004	0.004	151
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.041	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
Asphalt Paving											
Off-Gas	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment [4]	0.011	0.140	0.020	0.000	0.000	0.001	0.001	0.000	0.001	0.001	20
On-Road Equipment	0.000	0.002	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2
2017 Total [5, 6, 7]	**0.142**	**1.851**	**0.306**	**0.000**	**0.153**	**0.014**	**0.166**	**0.032**	**0.012**	**0.044**	**441**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category. Projects modeled are less than 1 mile in length.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. Although not included in the Road Construction Emissions Model estimates, one water truck was added to the mass grading phases to allow for fugitive dust control.
4. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
5. Results include emissions from paving activities and 3 mass site grading phases representing the following construction activities: grubbing / land clearing, grading / excavation, and drainage / utilities / sub-grade. Worker trips are also included using the default settings of URBEMIS2007.
6. URBEMIS2007 defaults for equipment counts and equipment hours/day were overwritten with numbers estimated by the Road Construction Emissions Model. The schedule was also set equal to that estimated by the Roadway Construction Emissions Model.
7. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-21 BNSF Ave 21: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the BNSF Ave 21 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Fresno County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	3.625	15.779	30.066	0.001	1.264	1.332	2.596	0.265	1.225	1.490	3,608
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	1.698	7.125	12.499	0.001	0.583	0.688	1.271	0.122	0.633	0.755	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	1.526	7.404	10.720	0.001	0.672	0.511	1.183	0.141	0.470	0.611	1,765	8.393	40.721	58.959	0.004	3.697	2.810	6.508	0.775	2.584	3.359	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	5.602	24.385	46.465	0.002	1.954	2.058	4.012	0.409	1.893	2.302	5,576
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.625	11.012	19.317	0.001	0.901	1.063	1.964	0.189	0.978	1.167	2,318
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.557	7.659	11.861	0.001	0.594	0.520	1.113	0.125	0.478	0.603	1,707
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.250	5.780	8.452	0.001	0.420	0.437	0.857	0.088	0.402	0.490	1,247
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	3.052	14.807	21.440	0.002	1.345	1.022	2.366	0.282	0.940	1.222	3,530
Merced County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.977	8.607	16.399	0.001	0.690	0.726	1.416	0.144	0.668	0.812	1,968
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.926	3.886	6.818	0.000	0.318	0.375	0.693	0.067	0.345	0.412	818
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.145	5.553	8.040	0.001	0.504	0.383	0.887	0.106	0.352	0.458	1,324
Sum of All Projects																						
2013 Total	**0.659**	**2.869**	**5.466**	**0.000**	**0.230**	**0.242**	**0.472**	**0.048**	**0.223**	**0.271**	**656**	**11.203**	**48.771**	**92.930**	**0.003**	**3.908**	**4.116**	**8.023**	**0.819**	**3.785**	**4.604**	**11,152**
2014 Total	**0.309**	**1.295**	**2.273**	**0.000**	**0.106**	**0.125**	**0.231**	**0.022**	**0.115**	**0.137**	**273**	**6.026**	**25.927**	**44.493**	**0.003**	**2.035**	**2.371**	**4.406**	**0.427**	**2.180**	**2.608**	**5,435**
2015 Total	**0.519**	**2.553**	**3.954**	**0.000**	**0.198**	**0.173**	**0.371**	**0.042**	**0.159**	**0.201**	**569**	**2.823**	**14.285**	**21.015**	**0.002**	**0.992**	**0.930**	**1.922**	**0.209**	**0.855**	**1.063**	**3,067**
2016 Total	**0.417**	**1.927**	**2.817**	**0.000**	**0.140**	**0.146**	**0.286**	**0.029**	**0.134**	**0.163**	**416**	**2.267**	**10.609**	**14.721**	**0.002**	**0.639**	**0.752**	**1.391**	**0.135**	**0.691**	**0.826**	**2,209**
2017 Total	**1.526**	**7.404**	**10.720**	**0.001**	**0.672**	**0.511**	**1.183**	**0.141**	**0.470**	**0.611**	**1,765**	**12.590**	**61.081**	**88.439**	**0.006**	**5.546**	**4.215**	**9.761**	**1.163**	**3.876**	**5.039**	**14,561**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	Included in the RTP				Not Included in the RTP			
County	Structures	> 2.5 miles	< 2.5 miles	< 1 mile	Structures	> 2.5 miles	< 2.5 miles	< 1 mile
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	17	0	3	8
Merced	0	0	0	0	6	1	0	3

B.1-21 BNSF Ave 21: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the BNSF Ave 21 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Mitigated)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Fresno County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	1.333	15.779	3.381	0.001	1.148	0.138	1.285	0.241	0.126	0.367	3,608
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.632	7.125	1.426	0.001	0.529	0.072	0.601	0.111	0.066	0.177	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.570	7.404	1.225	0.001	0.610	0.054	0.664	0.128	0.050	0.178	1,765	3.134	40.721	6.735	0.004	3.357	0.298	3.654	0.704	0.273	0.977	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.059	24.385	5.225	0.002	1.773	0.213	1.987	0.372	0.195	0.567	5,576
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.976	11.012	2.204	0.001	0.818	0.111	0.929	0.172	0.102	0.274	2,318
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.576	7.659	1.343	0.001	0.539	0.055	0.594	0.113	0.050	0.163	1,707
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.495	5.780	1.027	0.001	0.382	0.049	0.431	0.080	0.045	0.125	1,247
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.140	14.807	2.449	0.002	1.221	0.108	1.329	0.256	0.099	0.355	3,530
Merced County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.727	8.607	1.844	0.001	0.626	0.075	0.701	0.131	0.069	0.200	1,968
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.345	3.886	0.778	0.000	0.289	0.039	0.328	0.061	0.036	0.097	818
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.427	5.553	0.918	0.001	0.458	0.041	0.498	0.096	0.037	0.133	1,324
Sum of All Projects																						
2013 Total	**0.242**	**2.869**	**0.615**	**0.000**	**0.209**	**0.025**	**0.234**	**0.044**	**0.023**	**0.067**	**656**	**4.119**	**48.771**	**10.450**	**0.003**	**3.547**	**0.426**	**3.973**	**0.743**	**0.391**	**1.134**	**11,152**
2014 Total	**0.115**	**1.295**	**0.259**	**0.000**	**0.096**	**0.013**	**0.109**	**0.020**	**0.012**	**0.032**	**273**	**2.243**	**25.927**	**5.081**	**0.003**	**1.848**	**0.249**	**2.097**	**0.388**	**0.228**	**0.616**	**5,435**
2015 Total	**0.192**	**2.553**	**0.448**	**0.000**	**0.180**	**0.018**	**0.198**	**0.038**	**0.017**	**0.054**	**569**	**1.049**	**14.285**	**2.395**	**0.002**	**0.901**	**0.099**	**1.000**	**0.190**	**0.091**	**0.280**	**3,067**
2016 Total	**0.165**	**1.927**	**0.342**	**0.000**	**0.127**	**0.016**	**0.144**	**0.027**	**0.015**	**0.042**	**416**	**0.942**	**10.609**	**1.885**	**0.002**	**0.581**	**0.088**	**0.669**	**0.123**	**0.081**	**0.204**	**2,209**
2017 Total	**0.570**	**7.404**	**1.225**	**0.001**	**0.610**	**0.054**	**0.664**	**0.128**	**0.050**	**0.178**	**1,765**	**4.701**	**61.081**	**10.103**	**0.006**	**5.035**	**0.447**	**5.482**	**1.056**	**0.409**	**1.465**	**14,561**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	Included in the RTP				Not Included in the RTP			
County	Structures	> 2.5 miles	< 2.5 miles	< 1 mile	Structures	> 2.5 miles	< 2.5 miles	< 1 mile
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	17	0	3	8
Merced	0	0	0	0	6	1	0	3

B.1-22 BNSF Ave 24: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the BNSF Ave 24 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Fresno County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	3.625	15.779	30.066	0.001	1.264	1.332	2.596	0.265	1.225	1.490	3,608
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	1.698	7.125	12.499	0.001	0.583	0.688	1.271	0.122	0.633	0.755	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	1.526	7.404	10.720	0.001	0.672	0.511	1.183	0.141	0.470	0.611	1,765	8.393	40.721	58.959	0.004	3.697	2.810	6.508	0.775	2.584	3.359	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	8.567	37.295	71.064	0.003	2.988	3.147	6.135	0.626	2.895	3.521	8,528
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	4.015	16.841	29.544	0.002	1.378	1.627	3.004	0.289	1.496	1.785	3,545
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.557	7.659	11.861	0.001	0.594	0.520	1.113	0.125	0.478	0.603	1,707
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.250	5.780	8.452	0.001	0.420	0.437	0.857	0.088	0.402	0.490	1,247
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.671	12.957	18.760	0.001	1.176	0.894	2.071	0.247	0.822	1.069	3,089
Merced County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.977	8.607	16.399	0.001	0.690	0.726	1.416	0.144	0.668	0.812	1,968
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.926	3.886	6.818	0.000	0.318	0.375	0.693	0.067	0.345	0.412	818
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.145	5.553	8.040	0.001	0.504	0.383	0.887	0.106	0.352	0.458	1,324
Sum of All Projects																						
2013 Total	**0.659**	**2.869**	**5.466**	**0.000**	**0.230**	**0.242**	**0.472**	**0.048**	**0.223**	**0.271**	**656**	**14.169**	**61.681**	**117.529**	**0.004**	**4.942**	**5.205**	**10.147**	**1.035**	**4.787**	**5.823**	**14,104**
2014 Total	**0.309**	**1.295**	**2.273**	**0.000**	**0.106**	**0.125**	**0.231**	**0.022**	**0.115**	**0.137**	**273**	**7.416**	**31.757**	**54.720**	**0.003**	**2.512**	**2.934**	**5.446**	**0.527**	**2.698**	**3.225**	**6,662**
2015 Total	**0.519**	**2.553**	**3.954**	**0.000**	**0.198**	**0.173**	**0.371**	**0.042**	**0.159**	**0.201**	**569**	**2.823**	**14.285**	**21.015**	**0.002**	**0.992**	**0.930**	**1.922**	**0.209**	**0.855**	**1.063**	**3,067**
2016 Total	**0.417**	**1.927**	**2.817**	**0.000**	**0.140**	**0.146**	**0.286**	**0.029**	**0.134**	**0.163**	**416**	**2.267**	**10.609**	**14.721**	**0.002**	**0.639**	**0.752**	**1.391**	**0.135**	**0.691**	**0.826**	**2,209**
2017 Total	**1.526**	**7.404**	**10.720**	**0.001**	**0.672**	**0.511**	**1.183**	**0.141**	**0.470**	**0.611**	**1,765**	**12.208**	**59.230**	**85.759**	**0.006**	**5.378**	**4.087**	**9.466**	**1.128**	**3.759**	**4.886**	**14,120**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	Included in the RTP				Not Included in the RTP			
County	Structures	> 2.5 miles	< 2.5 miles	< 1 mile	Structures	> 2.5 miles	< 2.5 miles	< 1 mile
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	26	0	3	7
Merced	0	0	0	0	6	1	0	3

B.1-22 BNSF Ave 24: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the BNSF Ave 24 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Mitigated)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Fresno County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	1.333	15.779	3.381	0.001	1.148	0.138	1.285	0.241	0.126	0.367	3,608
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.632	7.125	1.426	0.001	0.529	0.072	0.601	0.111	0.066	0.177	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.570	7.404	1.225	0.001	0.610	0.054	0.664	0.128	0.050	0.178	1,765	3.134	40.721	6.735	0.004	3.357	0.298	3.654	0.704	0.273	0.977	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	3.150	37.295	7.991	0.003	2.712	0.326	3.038	0.568	0.299	0.867	8,528
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.493	16.841	3.371	0.002	1.251	0.170	1.421	0.262	0.156	0.419	3,545
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.576	7.659	1.343	0.001	0.539	0.055	0.594	0.113	0.050	0.163	1,707
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.495	5.780	1.027	0.001	0.382	0.049	0.431	0.080	0.045	0.125	1,247
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.997	12.957	2.143	0.001	1.068	0.095	1.163	0.224	0.087	0.311	3,089
Merced County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.727	8.607	1.844	0.001	0.626	0.075	0.701	0.131	0.069	0.200	1,968
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.345	3.886	0.778	0.000	0.289	0.039	0.328	0.061	0.036	0.097	818
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.427	5.553	0.918	0.001	0.458	0.041	0.498	0.096	0.037	0.133	1,324
Sum of All Projects																						
2013 Total	**0.242**	**2.869**	**0.615**	**0.000**	**0.209**	**0.025**	**0.234**	**0.044**	**0.023**	**0.067**	**656**	**5.209**	**61.681**	**13.216**	**0.004**	**4.486**	**0.539**	**5.025**	**0.940**	**0.494**	**1.435**	**14,104**
2014 Total	**0.115**	**1.295**	**0.259**	**0.000**	**0.096**	**0.013**	**0.109**	**0.020**	**0.012**	**0.032**	**273**	**2.760**	**31.757**	**6.248**	**0.003**	**2.281**	**0.308**	**2.589**	**0.479**	**0.282**	**0.761**	**6,662**
2015 Total	**0.192**	**2.553**	**0.448**	**0.000**	**0.180**	**0.018**	**0.198**	**0.038**	**0.017**	**0.054**	**569**	**1.049**	**14.285**	**2.395**	**0.002**	**0.901**	**0.099**	**1.000**	**0.190**	**0.091**	**0.280**	**3,067**
2016 Total	**0.165**	**1.927**	**0.342**	**0.000**	**0.127**	**0.016**	**0.144**	**0.027**	**0.015**	**0.042**	**416**	**0.942**	**10.609**	**1.885**	**0.002**	**0.581**	**0.088**	**0.669**	**0.123**	**0.081**	**0.204**	**2,209**
2017 Total	**0.570**	**7.404**	**1.225**	**0.001**	**0.610**	**0.054**	**0.664**	**0.128**	**0.050**	**0.178**	**1,765**	**4.559**	**59.230**	**9.797**	**0.006**	**4.882**	**0.433**	**5.315**	**1.024**	**0.397**	**1.421**	**14,120**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	Included in the RTP				Not Included in the RTP			
County	Structures	> 2.5 miles	< 2.5 miles	< 1 mile	Structures	> 2.5 miles	< 2.5 miles	< 1 mile
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	26	0	3	7
Merced	0	0	0	0	6	1	0	3

B.1-23 UPRR Ave 21: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the UPRR Ave 21 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
Fresno County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	3.625	15.779	30.066	0.001	1.264	1.332	2.596	0.265	1.225	1.490	3,608
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	1.698	7.125	12.499	0.001	0.583	0.688	1.271	0.122	0.633	0.755	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	1.526	7.404	10.720	0.001	0.672	0.511	1.183	0.141	0.470	0.611	1,765	8.393	40.721	58.959	0.004	3.697	2.810	6.508	0.775	2.584	3.359	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	3.295	14.344	27.332	0.001	1.149	1.210	2.360	0.241	1.113	1.354	3,280
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.544	6.477	11.363	0.001	0.530	0.626	1.156	0.111	0.575	0.686	1,363
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.164	5.856	8.788	0.001	0.350	0.366	0.716	0.074	0.336	0.410	1,200
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.899	9.938	13.731	0.002	0.598	0.615	1.213	0.126	0.565	0.691	2,040
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.526	7.244	9.403	0.002	0.328	0.473	0.801	0.070	0.434	0.504	1,442
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.595	12.765	19.768	0.001	0.989	0.866	1.856	0.208	0.797	1.004	2,846
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.084	9.633	14.087	0.002	0.701	0.728	1.429	0.147	0.670	0.817	2,079
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	6.867	33.317	48.239	0.003	3.025	2.299	5.324	0.634	2.114	2.749	7,942
Merced County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	0.330	1.434	2.733	0.000	0.115	0.121	0.236	0.024	0.111	0.135	328
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	0.154	0.648	1.136	0.000	0.053	0.063	0.116	0.011	0.058	0.069	136
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.763	3.702	5.360	0.000	0.336	0.255	0.592	0.070	0.235	0.305	882	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Sum of All Projects																						
2013 Total	**1.318**	**5.738**	**10.933**	**0.000**	**0.460**	**0.484**	**0.944**	**0.096**	**0.445**	**0.542**	**1,312**	**7.249**	**31.558**	**60.131**	**0.002**	**2.528**	**2.663**	**5.192**	**0.530**	**2.449**	**2.979**	**7,216**
2014 Total	**0.618**	**2.591**	**4.545**	**0.000**	**0.212**	**0.250**	**0.462**	**0.044**	**0.230**	**0.275**	**545**	**5.337**	**24.010**	**39.646**	**0.003**	**1.750**	**1.986**	**3.736**	**0.368**	**1.827**	**2.194**	**4,999**
2015 Total	**0.519**	**2.553**	**3.954**	**0.000**	**0.198**	**0.173**	**0.371**	**0.042**	**0.159**	**0.201**	**569**	**5.760**	**29.329**	**42.652**	**0.004**	**1.986**	**1.891**	**3.877**	**0.418**	**1.738**	**2.156**	**6,245**
2016 Total	**0.417**	**1.927**	**2.817**	**0.000**	**0.140**	**0.146**	**0.286**	**0.029**	**0.134**	**0.163**	**416**	**4.627**	**21.707**	**29.758**	**0.005**	**1.247**	**1.516**	**2.763**	**0.264**	**1.394**	**1.658**	**4,483**
2017 Total	**2.289**	**11.106**	**16.080**	**0.001**	**1.008**	**0.766**	**1.775**	**0.211**	**0.705**	**0.916**	**2,647**	**15.260**	**74.037**	**107.198**	**0.008**	**6.723**	**5.109**	**11.832**	**1.410**	**4.698**	**6.108**	**17,650**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	**Included in the RTP**				**Not Included in the RTP**			
County	**Structures**	**> 2.5 miles**	**< 2.5 miles**	**< 1 mile**	**Structures**	**> 2.5 miles**	**< 2.5 miles**	**< 1 mile**
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	10	3	5	18
Merced	2	0	0	2	1	1	0	0

B.1-23 UPRR Ave 21: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the UPRR Ave 21 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Mitigated)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
Fresno County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	1.333	15.779	3.381	0.001	1.148	0.138	1.285	0.241	0.126	0.367	3,608
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.632	7.125	1.426	0.001	0.529	0.072	0.601	0.111	0.066	0.177	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.570	7.404	1.225	0.001	0.610	0.054	0.664	0.128	0.050	0.178	1,765	3.134	40.721	6.735	0.004	3.357	0.298	3.654	0.704	0.273	0.977	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.211	14.344	3.074	0.001	1.043	0.125	1.169	0.219	0.115	0.334	3,280
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.574	6.477	1.297	0.001	0.481	0.065	0.547	0.101	0.060	0.161	1,363
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.436	5.856	1.008	0.001	0.318	0.040	0.358	0.067	0.036	0.103	1,200
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.711	9.938	1.577	0.002	0.543	0.067	0.610	0.115	0.061	0.175	2,040
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.670	7.244	1.288	0.002	0.298	0.059	0.358	0.064	0.054	0.118	1,442
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.960	12.765	2.239	0.001	0.898	0.091	0.990	0.189	0.084	0.272	2,846
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.825	9.633	1.712	0.002	0.636	0.081	0.718	0.134	0.074	0.209	2,079
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.564	33.317	5.511	0.003	2.746	0.244	2.990	0.576	0.223	0.799	7,942
Merced County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	0.121	1.434	0.307	0.000	0.104	0.013	0.117	0.022	0.011	0.033	328
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.057	0.648	0.130	0.000	0.048	0.007	0.055	0.010	0.006	0.016	136
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.285	3.702	0.612	0.000	0.305	0.027	0.332	0.064	0.025	0.089	882	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Sum of All Projects																						
2013 Total	**0.485**	**5.738**	**1.229**	**0.000**	**0.417**	**0.050**	**0.467**	**0.087**	**0.046**	**0.133**	**1,312**	**2.665**	**31.558**	**6.762**	**0.002**	**2.295**	**0.276**	**2.571**	**0.481**	**0.253**	**0.734**	**7,216**
2014 Total	**0.230**	**2.591**	**0.519**	**0.000**	**0.192**	**0.026**	**0.219**	**0.040**	**0.024**	**0.064**	**545**	**1.990**	**24.010**	**4.533**	**0.003**	**1.589**	**0.210**	**1.799**	**0.334**	**0.192**	**0.526**	**4,999**
2015 Total	**0.192**	**2.553**	**0.448**	**0.000**	**0.180**	**0.018**	**0.198**	**0.038**	**0.017**	**0.054**	**569**	**2.144**	**29.329**	**4.867**	**0.004**	**1.803**	**0.203**	**2.006**	**0.380**	**0.185**	**0.565**	**6,245**
2016 Total	**0.165**	**1.927**	**0.342**	**0.000**	**0.127**	**0.016**	**0.144**	**0.027**	**0.015**	**0.042**	**416**	**1.942**	**21.707**	**3.858**	**0.005**	**1.134**	**0.180**	**1.314**	**0.240**	**0.164**	**0.405**	**4,483**
2017 Total	**0.855**	**11.106**	**1.837**	**0.001**	**0.915**	**0.081**	**0.997**	**0.192**	**0.074**	**0.266**	**2,647**	**5.698**	**74.037**	**12.246**	**0.008**	**6.103**	**0.542**	**6.644**	**1.280**	**0.496**	**1.776**	**17,650**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	**Included in the RTP**				**Not Included in the RTP**			
County	**Structures**	**> 2.5 miles**	**< 2.5 miles**	**< 1 mile**	**Structures**	**> 2.5 miles**	**< 2.5 miles**	**< 1 mile**
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	10	3	5	18
Merced	2	0	0	2	1	1	0	0

B.1-24 UPRR Ave 24: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the UPRR Ave 24 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
Fresno County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	3.625	15.779	30.066	0.001	1.264	1.332	2.596	0.265	1.225	1.490	3,608
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	1.698	7.125	12.499	0.001	0.583	0.688	1.271	0.122	0.633	0.755	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	1.526	7.404	10.720	0.001	0.672	0.511	1.183	0.141	0.470	0.611	1,765	8.393	40.721	58.959	0.004	3.697	2.810	6.508	0.775	2.584	3.359	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	4.613	20.082	38.265	0.001	1.609	1.695	3.304	0.337	1.559	1.896	4,592
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.162	9.068	15.908	0.001	0.742	0.876	1.618	0.156	0.805	0.961	1,909
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.164	5.856	8.788	0.001	0.350	0.366	0.716	0.074	0.336	0.410	1,200
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.899	9.938	13.731	0.002	0.598	0.615	1.213	0.126	0.565	0.691	2,040
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.526	7.244	9.403	0.002	0.328	0.473	0.801	0.070	0.434	0.504	1,442
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	3.114	15.319	23.721	0.002	1.187	1.040	2.227	0.249	0.956	1.205	3,415
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.500	11.560	16.905	0.002	0.841	0.874	1.715	0.177	0.804	0.981	2,494
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	4.960	24.062	34.839	0.002	2.185	1.661	3.845	0.458	1.527	1.985	5,736
Merced County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	0.989	4.303	8.200	0.000	0.345	0.363	0.708	0.072	0.334	0.406	984
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	0.463	1.943	3.409	0.000	0.159	0.188	0.347	0.033	0.173	0.206	409
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416
Projects < 1 mile																						
2017 Total	0.763	3.702	5.360	0.000	0.336	0.255	0.592	0.070	0.235	0.305	882	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Sum of All Projects																						
2013 Total	**1.318**	**5.738**	**10.933**	**0.000**	**0.460**	**0.484**	**0.944**	**0.096**	**0.445**	**0.542**	**1,312**	**9.226**	**40.164**	**76.531**	**0.003**	**3.218**	**3.389**	**6.607**	**0.674**	**3.117**	**3.791**	**9,184**
2014 Total	**0.618**	**2.591**	**4.545**	**0.000**	**0.212**	**0.250**	**0.462**	**0.044**	**0.230**	**0.275**	**545**	**6.264**	**27.897**	**46.463**	**0.003**	**2.068**	**2.362**	**4.429**	**0.434**	**2.172**	**2.606**	**5,817**
2015 Total	**0.519**	**2.553**	**3.954**	**0.000**	**0.198**	**0.173**	**0.371**	**0.042**	**0.159**	**0.201**	**569**	**6.799**	**34.436**	**50.560**	**0.005**	**2.381**	**2.238**	**4.619**	**0.501**	**2.057**	**2.558**	**7,383**
2016 Total	**0.417**	**1.927**	**2.817**	**0.000**	**0.140**	**0.146**	**0.286**	**0.029**	**0.134**	**0.163**	**416**	**5.460**	**25.560**	**35.393**	**0.006**	**1.527**	**1.808**	**3.335**	**0.323**	**1.662**	**1.984**	**5,314**
2017 Total	**2.289**	**11.106**	**16.080**	**0.001**	**1.008**	**0.766**	**1.775**	**0.211**	**0.705**	**0.916**	**2,647**	**13.353**	**64.783**	**93.799**	**0.007**	**5.882**	**4.471**	**10.353**	**1.233**	**4.111**	**5.345**	**15,443**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	**Included in the RTP**				**Not Included in the RTP**			
County	**Structures**	**> 2.5 miles**	**< 2.5 miles**	**< 1 mile**	**Structures**	**> 2.5 miles**	**< 2.5 miles**	**< 1 mile**
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	14	3	6	13
Merced	2	0	0	2	3	1	1	0

B.1-24 UPRR Ave 24: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the UPRR Ave 24 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Mitigated)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Fresno County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	1.333	15.779	3.381	0.001	1.148	0.138	1.285	0.241	0.126	0.367	3,608
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.632	7.125	1.426	0.001	0.529	0.072	0.601	0.111	0.066	0.177	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.570	7.404	1.225	0.001	0.610	0.054	0.664	0.128	0.050	0.178	1,765	3.134	40.721	6.735	0.004	3.357	0.298	3.654	0.704	0.273	0.977	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.696	20.082	4.303	0.001	1.461	0.175	1.636	0.306	0.161	0.467	4,592
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.804	9.068	1.815	0.001	0.674	0.092	0.765	0.141	0.084	0.225	1,909
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.436	5.856	1.008	0.001	0.318	0.040	0.358	0.067	0.036	0.103	1,200
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.711	9.938	1.577	0.002	0.543	0.067	0.610	0.115	0.061	0.175	2,040
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.670	7.244	1.288	0.002	0.298	0.059	0.358	0.064	0.054	0.118	1,442
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.151	15.319	2.686	0.002	1.078	0.110	1.188	0.226	0.100	0.327	3,415
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.990	11.560	2.054	0.002	0.764	0.098	0.861	0.161	0.089	0.250	2,494
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.852	24.062	3.980	0.002	1.983	0.176	2.159	0.416	0.161	0.577	5,736
Merced County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	0.363	4.303	0.922	0.000	0.313	0.038	0.351	0.066	0.034	0.100	984
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.172	1.943	0.389	0.000	0.144	0.020	0.164	0.030	0.018	0.048	409
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416
Projects < 1 mile																						
2017 Total	0.285	3.702	0.612	0.000	0.305	0.027	0.332	0.064	0.025	0.089	882	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Sum of All Projects																						
2013 Total	**0.485**	**5.738**	**1.229**	**0.000**	**0.417**	**0.050**	**0.467**	**0.087**	**0.046**	**0.133**	**1,312**	**3.392**	**40.164**	**8.606**	**0.003**	**2.921**	**0.351**	**3.272**	**0.612**	**0.322**	**0.934**	**9,184**
2014 Total	**0.230**	**2.591**	**0.519**	**0.000**	**0.192**	**0.026**	**0.219**	**0.040**	**0.024**	**0.064**	**545**	**2.334**	**27.897**	**5.311**	**0.003**	**1.877**	**0.249**	**2.127**	**0.395**	**0.228**	**0.623**	**5,817**
2015 Total	**0.192**	**2.553**	**0.448**	**0.000**	**0.180**	**0.018**	**0.198**	**0.038**	**0.017**	**0.054**	**569**	**2.528**	**34.436**	**5.763**	**0.005**	**2.163**	**0.239**	**2.402**	**0.455**	**0.218**	**0.674**	**7,383**
2016 Total	**0.165**	**1.927**	**0.342**	**0.000**	**0.127**	**0.016**	**0.144**	**0.027**	**0.015**	**0.042**	**416**	**2.272**	**25.560**	**4.543**	**0.006**	**1.388**	**0.213**	**1.601**	**0.294**	**0.194**	**0.488**	**5,314**
2017 Total	**0.855**	**11.106**	**1.837**	**0.001**	**0.915**	**0.081**	**0.997**	**0.192**	**0.074**	**0.266**	**2,647**	**4.986**	**64.783**	**10.715**	**0.007**	**5.340**	**0.474**	**5.814**	**1.120**	**0.434**	**1.554**	**15,443**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	Included in the RTP				Not Included in the RTP			
County	Structures	> 2.5 miles	< 2.5 miles	< 1 mile	Structures	> 2.5 miles	< 2.5 miles	< 1 mile
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	14	3	6	13
Merced	2	0	0	2	3	1	1	0

B.1-25 Hybrid Ave 24: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the Hybrid Ave 24 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
Fresno County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	3.625	15.779	30.066	0.001	1.264	1.332	2.596	0.265	1.225	1.490	3,608
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	1.698	7.125	12.499	0.001	0.583	0.688	1.271	0.122	0.633	0.755	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	1.526	7.404	10.720	0.001	0.672	0.511	1.183	0.141	0.470	0.611	1,765	8.393	40.721	58.959	0.004	3.697	2.810	6.508	0.775	2.584	3.359	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	8.897	38.730	73.797	0.003	3.103	3.268	6.371	0.650	3.006	3.656	8,856
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	4.169	17.489	30.680	0.002	1.431	1.689	3.120	0.300	1.553	1.854	3,681
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	3.052	14.807	21.440	0.002	1.345	1.022	2.366	0.282	0.940	1.222	3,530
Merced County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	0.989	4.303	8.200	0.000	0.345	0.363	0.708	0.072	0.334	0.406	984
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	0.463	1.943	3.409	0.000	0.159	0.188	0.347	0.033	0.173	0.206	409
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416
Projects < 1 mile																						
2017 Total	0.382	1.851	2.680	0.000	0.168	0.128	0.296	0.035	0.117	0.153	441	0.763	3.702	5.360	0.000	0.336	0.255	0.592	0.070	0.235	0.305	882
Sum of All Projects																						
2013 Total	**1.318**	**5.738**	**10.933**	**0.000**	**0.460**	**0.484**	**0.944**	**0.096**	**0.445**	**0.542**	**1,312**	**13.510**	**58.812**	**112.063**	**0.004**	**4.712**	**4.963**	**9.675**	**0.987**	**4.565**	**5.552**	**13,448**
2014 Total	**0.618**	**2.591**	**4.545**	**0.000**	**0.212**	**0.250**	**0.462**	**0.044**	**0.230**	**0.275**	**545**	**7.107**	**30.461**	**52.447**	**0.003**	**2.406**	**2.809**	**5.215**	**0.505**	**2.583**	**3.088**	**6,390**
2015 Total	**0.519**	**2.553**	**3.954**	**0.000**	**0.198**	**0.173**	**0.371**	**0.042**	**0.159**	**0.201**	**569**	**1.785**	**9.179**	**13.107**	**0.001**	**0.596**	**0.583**	**1.180**	**0.126**	**0.536**	**0.662**	**1,929**
2016 Total	**0.417**	**1.927**	**2.817**	**0.000**	**0.140**	**0.146**	**0.286**	**0.029**	**0.134**	**0.163**	**416**	**1.434**	**6.756**	**9.086**	**0.002**	**0.359**	**0.461**	**0.820**	**0.076**	**0.424**	**0.500**	**1,377**
2017 Total	**1.908**	**9.255**	**13.400**	**0.001**	**0.840**	**0.639**	**1.479**	**0.176**	**0.587**	**0.764**	**2,206**	**12.208**	**59.230**	**85.759**	**0.006**	**5.378**	**4.087**	**9.466**	**1.128**	**3.759**	**4.886**	**14,120**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	**Included in the RTP**				**Not Included in the RTP**			
County	**Structures**	**> 2.5 miles**	**< 2.5 miles**	**< 1 mile**	**Structures**	**> 2.5 miles**	**< 2.5 miles**	**< 1 mile**
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	27	0	0	8
Merced	2	0	0	1	3	1	1	2

B.1-25 Hybrid Ave 24: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the Hybrid Ave 24 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Mitigated)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Fresno County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	1.333	15.779	3.381	0.001	1.148	0.138	1.285	0.241	0.126	0.367	3,608
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.632	7.125	1.426	0.001	0.529	0.072	0.601	0.111	0.066	0.177	1,500
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.570	7.404	1.225	0.001	0.610	0.054	0.664	0.128	0.050	0.178	1,765	3.134	40.721	6.735	0.004	3.357	0.298	3.654	0.704	0.273	0.977	9,707
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	3.271	38.730	8.299	0.003	2.817	0.338	3.155	0.590	0.310	0.901	8,856
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.550	17.489	3.501	0.002	1.299	0.177	1.476	0.273	0.162	0.435	3,681
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.140	14.807	2.449	0.002	1.221	0.108	1.329	0.256	0.099	0.355	3,530
Merced County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	0.363	4.303	0.922	0.000	0.313	0.038	0.351	0.066	0.034	0.100	984
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.172	1.943	0.389	0.000	0.144	0.020	0.164	0.030	0.018	0.048	409
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416
Projects < 1 mile																						
2017 Total	0.142	1.851	0.306	0.000	0.153	0.014	0.166	0.032	0.012	0.044	441	0.285	3.702	0.612	0.000	0.305	0.027	0.332	0.064	0.025	0.089	882
Sum of All Projects																						
2013 Total	**0.485**	**5.738**	**1.229**	**0.000**	**0.417**	**0.050**	**0.467**	**0.087**	**0.046**	**0.133**	**1,312**	**4.967**	**58.812**	**12.602**	**0.004**	**4.277**	**0.514**	**4.791**	**0.896**	**0.471**	**1.368**	**13,448**
2014 Total	**0.230**	**2.591**	**0.519**	**0.000**	**0.192**	**0.026**	**0.219**	**0.040**	**0.024**	**0.064**	**545**	**2.645**	**30.461**	**5.989**	**0.003**	**2.185**	**0.295**	**2.479**	**0.459**	**0.270**	**0.729**	**6,390**
2015 Total	**0.192**	**2.553**	**0.448**	**0.000**	**0.180**	**0.018**	**0.198**	**0.038**	**0.017**	**0.054**	**569**	**0.666**	**9.179**	**1.499**	**0.001**	**0.542**	**0.063**	**0.604**	**0.114**	**0.057**	**0.171**	**1,929**
2016 Total	**0.165**	**1.927**	**0.342**	**0.000**	**0.127**	**0.016**	**0.144**	**0.027**	**0.015**	**0.042**	**416**	**0.612**	**6.756**	**1.201**	**0.002**	**0.326**	**0.056**	**0.382**	**0.069**	**0.051**	**0.120**	**1,377**
2017 Total	**0.712**	**9.255**	**1.531**	**0.001**	**0.763**	**0.068**	**0.831**	**0.160**	**0.062**	**0.222**	**2,206**	**4.559**	**59.230**	**9.797**	**0.006**	**4.882**	**0.433**	**5.315**	**1.024**	**0.397**	**1.421**	**14,120**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	Included in the RTP				Not Included in the RTP			
County	Structures	> 2.5 miles	< 2.5 miles	< 1 mile	Structures	> 2.5 miles	< 2.5 miles	< 1 mile
Fresno	2	0	1	4	11	1	0	22
Madera	0	0	0	0	27	0	0	8
Merced	2	0	0	1	3	1	1	2

B.1-26 Hybrid Ave 21: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the Hybrid Ave 21 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Programmatic)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Fresno County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	3.954	17.213	32.799	0.001	1.379	1.453	2.832	0.289	1.336	1.625	3,936
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	1.853	7.773	13.636	0.001	0.636	0.751	1.387	0.133	0.690	0.824	1,636
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	1.526	7.404	10.720	0.001	0.672	0.511	1.183	0.141	0.470	0.611	1,765	10.682	51.826	75.039	0.005	4.706	3.577	8.282	0.987	3.289	4.276	12,355
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	5.602	24.385	46.465	0.002	1.954	2.058	4.012	0.409	1.893	2.302	5,576
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.625	11.012	19.317	0.001	0.901	1.063	1.964	0.189	0.978	1.167	2,318
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	4.197	20.360	29.480	0.002	1.849	1.405	3.254	0.388	1.292	1.680	4,854
Merced County																						
Structures																						
2013 Total	0.659	2.869	5.466	0.000	0.230	0.242	0.472	0.048	0.223	0.271	656	0.989	4.303	8.200	0.000	0.345	0.363	0.708	0.072	0.334	0.406	984
2014 Total	0.309	1.295	2.273	0.000	0.106	0.125	0.231	0.022	0.115	0.137	273	0.463	1.943	3.409	0.000	0.159	0.188	0.347	0.033	0.173	0.206	409
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.388	1.952	2.929	0.000	0.117	0.122	0.239	0.025	0.112	0.137	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.633	3.313	4.577	0.001	0.199	0.205	0.404	0.042	0.188	0.230	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.509	2.415	3.134	0.001	0.109	0.158	0.267	0.023	0.145	0.168	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.519	2.553	3.954	0.000	0.198	0.173	0.371	0.042	0.159	0.201	569
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.417	1.927	2.817	0.000	0.140	0.146	0.286	0.029	0.134	0.163	416
Projects < 1 mile																						
2017 Total	0.382	1.851	2.680	0.000	0.168	0.128	0.296	0.035	0.117	0.153	441	0.763	3.702	5.360	0.000	0.336	0.255	0.592	0.070	0.235	0.305	882
Sum of All Projects																						
2013 Total	**1.318**	**5.738**	**10.933**	**0.000**	**0.460**	**0.484**	**0.944**	**0.096**	**0.445**	**0.542**	**1,312**	**10.544**	**45.902**	**87.464**	**0.003**	**3.678**	**3.874**	**7.551**	**0.771**	**3.563**	**4.333**	**10,496**
2014 Total	**0.618**	**2.591**	**4.545**	**0.000**	**0.212**	**0.250**	**0.462**	**0.044**	**0.230**	**0.275**	**545**	**5.717**	**24.632**	**42.220**	**0.003**	**1.929**	**2.246**	**4.175**	**0.405**	**2.065**	**2.470**	**5,163**
2015 Total	**0.519**	**2.553**	**3.954**	**0.000**	**0.198**	**0.173**	**0.371**	**0.042**	**0.159**	**0.201**	**569**	**2.304**	**11.732**	**17.061**	**0.002**	**0.794**	**0.756**	**1.551**	**0.167**	**0.695**	**0.863**	**2,498**
2016 Total	**0.417**	**1.927**	**2.817**	**0.000**	**0.140**	**0.146**	**0.286**	**0.029**	**0.134**	**0.163**	**416**	**1.851**	**8.683**	**11.903**	**0.002**	**0.499**	**0.606**	**1.105**	**0.106**	**0.557**	**0.663**	**1,793**
2017 Total	**1.908**	**9.255**	**13.400**	**0.001**	**0.840**	**0.639**	**1.479**	**0.176**	**0.587**	**0.764**	**2,206**	**15.642**	**75.888**	**109.878**	**0.008**	**6.891**	**5.237**	**12.128**	**1.445**	**4.816**	**6.261**	**18,091**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	Included in the RTP				Not Included in the RTP			
County	Structures	> 2.5 miles	< 2.5 miles	< 1 mile	Structures	> 2.5 miles	< 2.5 miles	< 1 mile
Fresno	2	0	1	4	12	1	0	28
Madera	0	0	0	0	17	0	1	11
Merced	2	0	0	1	3	1	1	2

B.1-26 Hybrid Ave 21: Construction Emissions from Roadway Projects

This tab provides data for Roadway Projects occuring as a result of the Hybrid Ave 21 Alternative. Assumptions are documented in the Data Request (Roadway tabs).

Construction Emissions (Mitigated)

	RTP Included Emissions (tpy) [1]											Non-RTP Included Emissions (tpy) [2]										
Construction Phase [3]	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Fresno County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	1.454	17.213	3.688	0.001	1.252	0.150	1.402	0.262	0.138	0.400	3,936
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.689	7.773	1.556	0.001	0.577	0.079	0.656	0.121	0.072	0.193	1,636
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 1 mile																						
2017 Total	0.570	7.404	1.225	0.001	0.610	0.054	0.664	0.128	0.050	0.178	1,765	3.989	51.826	8.572	0.005	4.272	0.379	4.651	0.896	0.347	1.243	12,355
Madera County																						
Structures																						
2013 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	2.059	24.385	5.225	0.002	1.773	0.213	1.987	0.372	0.195	0.567	5,576
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.976	11.012	2.204	0.001	0.818	0.111	0.929	0.172	0.102	0.274	2,318
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416
Projects < 1 mile																						
2017 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	1.567	20.360	3.368	0.002	1.678	0.149	1.827	0.352	0.136	0.488	4,854
Merced County																						
Structures																						
2013 Total	0.242	2.869	0.615	0.000	0.209	0.025	0.234	0.044	0.023	0.067	656	0.363	4.303	0.922	0.000	0.313	0.038	0.351	0.066	0.034	0.100	984
2014 Total	0.115	1.295	0.259	0.000	0.096	0.013	0.109	0.020	0.012	0.032	273	0.172	1.943	0.389	0.000	0.144	0.020	0.164	0.030	0.018	0.048	409
Projects > 2.5 miles																						
2014 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.145	1.952	0.336	0.000	0.106	0.013	0.119	0.022	0.012	0.034	400
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.237	3.313	0.526	0.001	0.181	0.022	0.203	0.038	0.020	0.058	680
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.223	2.415	0.429	0.001	0.099	0.020	0.119	0.021	0.018	0.039	481
Projects < 2.5 miles																						
2015 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.192	2.553	0.448	0.000	0.180	0.018	0.198	0.038	0.017	0.054	569
2016 Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0	0.165	1.927	0.342	0.000	0.127	0.016	0.144	0.027	0.015	0.042	416
Projects < 1 mile																						
2017 Total	0.142	1.851	0.306	0.000	0.153	0.014	0.166	0.032	0.012	0.044	441	0.285	3.702	0.612	0.000	0.305	0.027	0.332	0.064	0.025	0.089	882
Sum of All Projects																						
2013 Total	**0.485**	**5.738**	**1.229**	**0.000**	**0.417**	**0.050**	**0.467**	**0.087**	**0.046**	**0.133**	**1,312**	**3.876**	**45.902**	**9.836**	**0.003**	**3.338**	**0.401**	**3.739**	**0.700**	**0.368**	**1.068**	**10,496**
2014 Total	**0.230**	**2.591**	**0.519**	**0.000**	**0.192**	**0.026**	**0.219**	**0.040**	**0.024**	**0.064**	**545**	**2.128**	**24.632**	**4.822**	**0.003**	**1.752**	**0.236**	**1.988**	**0.368**	**0.216**	**0.584**	**5,163**
2015 Total	**0.192**	**2.553**	**0.448**	**0.000**	**0.180**	**0.018**	**0.198**	**0.038**	**0.017**	**0.054**	**569**	**0.858**	**11.732**	**1.947**	**0.002**	**0.721**	**0.081**	**0.802**	**0.152**	**0.074**	**0.226**	**2,498**
2016 Total	**0.165**	**1.927**	**0.342**	**0.000**	**0.127**	**0.016**	**0.144**	**0.027**	**0.015**	**0.042**	**416**	**0.777**	**8.683**	**1.543**	**0.002**	**0.453**	**0.072**	**0.525**	**0.096**	**0.066**	**0.162**	**1,793**
2017 Total	**0.712**	**9.255**	**1.531**	**0.001**	**0.763**	**0.068**	**0.831**	**0.160**	**0.062**	**0.222**	**2,206**	**5.841**	**75.888**	**12.552**	**0.008**	**6.255**	**0.555**	**6.810**	**1.312**	**0.508**	**1.821**	**18,091**

Notes:

1. Roadway projects included in the RTP will not be summed into the project's total emissions as they would happen with or without construction of the HST.
2. Roadway projects not included in the RTP will be summed into the project's total emissions as they are only occurring due to HST construction.
3. URBEMIS2007 results were multiplied by the number of roadway projects, meeting the length designation, within each county. The number of roadway projects are tabulated on the Roadway tabs in the Data Request.

Project Type	Included in the RTP				Not Included in the RTP			
County	Structures	> 2.5 miles	< 2.5 miles	< 1 mile	Structures	> 2.5 miles	< 2.5 miles	< 1 mile
Fresno	2	0	1	4	12	1	0	28
Madera	0	0	0	0	17	0	1	11
Merced	2	0	0	1	3	1	1	2

B.1-27 Alignment Alternatives

This tab provides data that will be used to scale results on the Elevated Structures and Alternative Track tabs. Assumptions are documented in the Data Request ('Alignment' tab).

Alternative	Total Length	At-Grade Length	Elevated Length	Retained Fill Length	At-Grade Rail Length		Elevated Rail Length		Retained Fill Rail Length	
					2 Tracks	4 Tracks	2 Tracks	4 Tracks	2 Tracks	4 Tracks
Length Provided in Miles [1]										
BNSF (Avenue 21 Wye) Option	81.70	66.66	13.03	2.00	61.74	4.92	12.13	0.90	1.70	0.30
BNSF (Avenue 24 Wye) Option	83.84	67.88	13.96	2.00	67.21	0.67	9.17	4.79	1.70	0.30
UPRR (Avenue 21 Wye) Option [2]	72.32	35.97	35.01	1.33	33.77	2.20	28.91	6.10	0.93	0.40
UPRR (Avenue 24 Wye) Option	74.36	43.50	29.52	1.35	39.92	3.58	24.80	4.72	0.95	0.40
Hybrid (Avenue 24 Wye) Option	64.08	57.93	4.74	1.41	52.83	5.10	4.74	0.00	1.11	0.30
Hybrid (Avenue 21 Wye) option	72.76	51.90	19.45	1.41	48.40	3.50	18.55	0.90	1.11	0.30
HMF Station [3]	7.60	4.03	2.25	1.33	1.00	3.03	1.47	0.78	1.33	0.00
LMF Track [4]	0.07	0.04	0.02	0.01	0.01	0.03	0.01	0.01	0.01	0.00
HMF Track [5]	7.53	3.99	2.23	1.31	0.99	3.00	1.46	0.77	1.31	0.00
Length Converted to Feet [6]										
BNSF (Avenue 21 Wye) Option	431,357	351,952	68,820	10,585	325,974	25,978	64,068	4,752	9,001	1,584
BNSF (Avenue 24 Wye) Option	442,681	358,391	73,705	10,585	354,880	3,511	48,440	25,265	9,001	1,584
UPRR (Avenue 21 Wye) Option	381,828	189,942	184,877	7,009	178,326	11,616	152,669	32,208	4,897	2,112
UPRR (Avenue 24 Wye) Option	392,636	229,674	155,857	7,105	210,772	18,902	130,935	24,922	4,993	2,112
Hybrid (Avenue 24 Wye) Option	338,349	305,865	25,051	7,433	278,937	26,928	25,051	0	5,849	1,584
Hybrid (Avenue 21 Wye) option	384,161	274,032	102,696	7,433	255,552	18,480	97,944	4,752	5,849	1,584
LMF Track	385	204	114	67	51	153	74	39	67	0
HMF Track	39,769	21,084	11,752	6,933	5,251	15,834	7,687	4,065	6,933	0

Alternative	Material-Scaled Length (feet) [7, 8]			Alignment Scaling Factor [9, 10]			
	At-Grade Rail	Elevated Rail	Retained Fill Rail	At-Grade Rail	Elevated Rail	Retained Fill Rail	Elevated Structures
BNSF (Avenue 21 Wye) Option	377,930	73,572	12,169	103.07	20.07	3.32	16.35
BNSF (Avenue 24 Wye) Option	361,902	98,970	12,169	98.70	26.99	3.32	21.99
UPRR (Avenue 21 Wye) Option	201,558	217,085	9,121	54.97	59.20	2.49	48.24
UPRR (Avenue 24 Wye) Option	248,576	180,779	9,217	67.79	49.30	2.51	40.17
Hybrid (Avenue 24 Wye) Option	332,793	25,051	9,017	90.76	6.83	2.46	5.57
Hybrid (Avenue 21 Wye) option	292,512	107,448	9,017	79.78	29.30	2.46	23.88
LMF Track	357	153	67	0.71	0.31	0.13	0.31
HMF Track	36,918	15,817	6,933	73.84	31.63	13.87	31.63

Notes:

1. Data taken from AQ_lengths of alternatives_20110602.xlsx as provided by L. Black to K. Skadberg (6/2/11). The BNSF, UPRR, and Hybrid Alternatives contain the tracks for the Merced and Fresno Station.
2. The UPRR Ave 24 option was taken as the East Chow/24 option since it had a longer length than the West Chow/24 option.
3. The HMF Station was taken as the Castle Commerce Center HMF option since it had the longest length of the HMF options.
4. The portion of rail located at the Overnight Layover / Servicing Facility (LMF), constructed during HMF Phase II, was determined as follows: LMF Track = LMF Area Cleared x Total HMF Track / Total HMF Area Cleared.

Total HMF Area Cleared	**154**	acres
LMF Area Cleared	**1.5**	acres

5. The portion of rail located at the HMF, constructed during HMF Phase III, was determined as follows: HMF Track = Total HMF Track - LMF Track.
6. Conversion used 1 mile: **5,280** feet
7. It was assumed that all material quantities given per linear foot were for a 2-track width.
8. The Material-Scaled Length accounts for an increase or decrease in materials required to construct the at-grade, elevated, and retained fill rail segments based on the track width; track widths were scaled as follows:

2 Tracks	**1**	All the material quantity required for 2 tracks
4 Tracks	**2**	Twice the material quantity required for 4 tracks

9. The Alignment Scaling Factor was used to scale the At-Grade, Elevated, Retained Fill, and Elevated Structures URBEMIS2007 results to account for the full length of each alignment alternative (Emissions = URBEMIS2007 Emissions x Alignment Scaling Factor).
10. The Alignment Scaling Factor also accounts for the construction duration (years), taken from the Schedule presented in the Data Request:

At-Grade Alignment	**3.7**	years
Elevated Rail	**3.7**	years
Retained Fill Rail	**3.7**	years
Elevated Structures	**4.5**	years
LMF Track	**0.5**	years
HMF Track	**0.5**	years

B.1-28 URBEMIS2007 Elevated Structures: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of elevated structures that will be scaled on the Elevated Structures tab by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to structures built as part of the BNSF, UPRR, and Hybrid Alternatives.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy/1,000 ft) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
Quarter 1											
Off-Road Equipment	0.281	1.180	2.349	0.000	0.000	0.104	0.104	0.000	0.096	0.096	326
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.250	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	33
Quarter 2											
Off-Road Equipment	0.067	0.251	0.529	0.000	0.000	0.024	0.024	0.000	0.022	0.022	74
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.254	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 1											
Off-Road Equipment	0.289	1.217	2.422	0.000	0.000	0.108	0.108	0.000	0.099	0.099	336
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 2											
Off-Road Equipment	0.068	0.255	0.538	0.000	0.000	0.024	0.024	0.000	0.022	0.022	76
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q1 [2]	**0.288**	**1.431**	**2.362**	**0.000**	**0.002**	**0.105**	**0.107**	**0.001**	**0.097**	**0.097**	**359**
Total Q2 [2]	**0.074**	**0.505**	**0.543**	**0.000**	**0.002**	**0.024**	**0.026**	**0.001**	**0.022**	**0.023**	**108**
Total Q1 [2]	**0.297**	**1.475**	**2.436**	**0.000**	**0.002**	**0.108**	**0.110**	**0.001**	**0.100**	**0.100**	**371**
Total Q2 [2]	**0.075**	**0.513**	**0.551**	**0.000**	**0.002**	**0.025**	**0.027**	**0.001**	**0.023**	**0.023**	**110**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.

2. Results include repeating Quarters 1 and 2 (construction of elevated structures). Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while structures are built. The Quarters represent the usage of equipment groups over a 3-month period.

B.1-28 URBEMIS2007 Elevated Structures: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of elevated structures that will be scaled on the Elevated Structures tab by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to structures built as part of the BNSF, UPRR, and Hybrid Alternatives.

Construction Emissions (Mitigated)

	Emissions (tpy/1,000 ft) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
Quarter 1											
Off-Road Equipment [3]	0.102	1.180	0.261	0.000	0.000	0.011	0.011	0.000	0.010	0.010	326
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.250	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	33
Quarter 2											
Off-Road Equipment [3]	0.024	0.251	0.059	0.000	0.000	0.002	0.002	0.000	0.002	0.002	74
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.254	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 1											
Off-Road Equipment [3]	0.105	1.217	0.269	0.000	0.000	0.011	0.011	0.000	0.010	0.010	336
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 2											
Off-Road Equipment [3]	0.024	0.255	0.060	0.000	0.000	0.002	0.002	0.000	0.002	0.002	76
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q1 [4, 5]	**0.109**	**1.431**	**0.274**	**0.000**	**0.002**	**0.011**	**0.013**	**0.001**	**0.010**	**0.011**	**359**
Total Q2 [4, 5]	**0.032**	**0.505**	**0.072**	**0.000**	**0.002**	**0.003**	**0.005**	**0.001**	**0.003**	**0.004**	**108**
Total Q1 [4, 5]	**0.113**	**1.475**	**0.282**	**0.000**	**0.002**	**0.012**	**0.014**	**0.001**	**0.011**	**0.011**	**371**
Total Q2 [4, 5]	**0.032**	**0.513**	**0.073**	**0.000**	**0.002**	**0.003**	**0.005**	**0.001**	**0.003**	**0.004**	**110**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include repeating Quarters 1 and 2 (construction of elevated structures). Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while structures are built. The Quarters represent the usage of equipment groups over a 3-month period.
5. Mitigation applied included using off-road construction equipment that meets Tier 4 standards.

B.1-29 Elevated Structures: Construction Emissions from Building Activities

This tab provides the emissions resulting from construction of elevated structures by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to structures built as part of the BNSF, UPRR, and Hybrid Alternatives.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
BNSF Ave 21	6.091	32.506	48.826	0.011	0.054	2.180	2.235	0.020	2.002	2.022	7,851
BNSF Ave 24	8.194	43.728	65.681	0.015	0.073	2.933	3.006	0.026	2.694	2.720	10,561
UPRR Ave 21	17.974	95.915	144.067	0.032	0.160	6.434	6.594	0.058	5.908	5.966	23,165
UPRR Ave 24	14.968	79.873	119.973	0.027	0.134	5.358	5.491	0.048	4.920	4.968	19,291
Hybrid Ave 24	2.074	11.068	16.625	0.004	0.019	0.742	0.761	0.007	0.682	0.688	2,673
Hybrid Ave 21	8.896	47.474	71.307	0.016	0.079	3.184	3.264	0.029	2.924	2.953	11,466
2014 Construction											
BNSF Ave 21	12.017	64.155	96.309	0.021	0.107	4.301	4.408	0.039	3.950	3.989	15,491
BNSF Ave 24	16.165	86.301	129.555	0.029	0.145	5.786	5.930	0.052	5.313	5.365	20,839
UPRR Ave 21	35.458	189.297	284.172	0.063	0.317	12.690	13.007	0.114	11.654	11.769	45,709
UPRR Ave 24	29.528	157.639	236.646	0.053	0.264	10.568	10.832	0.095	9.705	9.801	38,064
Hybrid Ave 24	4.092	21.844	32.793	0.007	0.037	1.464	1.501	0.013	1.345	1.358	5,275
Hybrid Ave 21	17.550	93.694	140.653	0.031	0.157	6.281	6.438	0.057	5.768	5.825	22,624
2015 Construction											
BNSF Ave 21	12.017	64.155	96.309	0.021	0.107	4.301	4.408	0.039	3.950	3.989	15,491
BNSF Ave 24	16.165	86.301	129.555	0.029	0.145	5.786	5.930	0.052	5.313	5.365	20,839
UPRR Ave 21	35.458	189.297	284.172	0.063	0.317	12.690	13.007	0.114	11.654	11.769	45,709
UPRR Ave 24	29.528	157.639	236.646	0.053	0.264	10.568	10.832	0.095	9.705	9.801	38,064
Hybrid Ave 24	4.092	21.844	32.793	0.007	0.037	1.464	1.501	0.013	1.345	1.358	5,275
Hybrid Ave 21	17.550	93.694	140.653	0.031	0.157	6.281	6.438	0.057	5.768	5.825	22,624
2016 Construction											
BNSF Ave 21	12.017	64.155	96.309	0.021	0.107	4.301	4.408	0.039	3.950	3.989	15,491
BNSF Ave 24	16.165	86.301	129.555	0.029	0.145	5.786	5.930	0.052	5.313	5.365	20,839
UPRR Ave 21	35.458	189.297	284.172	0.063	0.317	12.690	13.007	0.114	11.654	11.769	45,709
UPRR Ave 24	29.528	157.639	236.646	0.053	0.264	10.568	10.832	0.095	9.705	9.801	38,064
Hybrid Ave 24	4.092	21.844	32.793	0.007	0.037	1.464	1.501	0.013	1.345	1.358	5,275
Hybrid Ave 21	17.550	93.694	140.653	0.031	0.157	6.281	6.438	0.057	5.768	5.825	22,624
2017 Construction											
BNSF Ave 21	12.017	64.155	96.309	0.021	0.107	4.301	4.408	0.039	3.950	3.989	15,491
BNSF Ave 24	16.165	86.301	129.555	0.029	0.145	5.786	5.930	0.052	5.313	5.365	20,839
UPRR Ave 21	35.458	189.297	284.172	0.063	0.317	12.690	13.007	0.114	11.654	11.769	45,709
UPRR Ave 24	29.528	157.639	236.646	0.053	0.264	10.568	10.832	0.095	9.705	9.801	38,064
Hybrid Ave 24	4.092	21.844	32.793	0.007	0.037	1.464	1.501	0.013	1.345	1.358	5,275
Hybrid Ave 21	17.550	93.694	140.653	0.031	0.157	6.281	6.438	0.057	5.768	5.825	22,624

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of each alternative.

B.1-29 Elevated Structures: Construction Emissions from Building Activities

This tab provides the emissions resulting from construction of elevated structures by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to structures built as part of the BNSF, UPRR, and Hybrid Alternatives.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2013 Construction											
BNSF Ave 21	2.372	32.506	5.805	0.011	0.054	0.249	0.303	0.020	0.226	0.245	7,851
BNSF Ave 24	3.190	43.728	7.809	0.015	0.073	0.335	0.408	0.026	0.304	0.330	10,561
UPRR Ave 21	6.998	95.915	17.129	0.032	0.160	0.735	0.895	0.058	0.666	0.724	23,165
UPRR Ave 24	5.828	79.873	14.264	0.027	0.134	0.612	0.746	0.048	0.555	0.603	19,291
Hybrid Ave 24	0.808	11.068	1.977	0.004	0.019	0.085	0.103	0.007	0.077	0.084	2,673
Hybrid Ave 21	3.464	47.474	8.478	0.016	0.079	0.364	0.443	0.029	0.330	0.358	11,466
2014 Construction											
BNSF Ave 21	4.680	64.155	11.452	0.021	0.107	0.492	0.599	0.039	0.445	0.484	15,491
BNSF Ave 24	6.295	86.301	15.406	0.029	0.145	0.661	0.806	0.052	0.599	0.651	20,839
UPRR Ave 21	13.808	189.297	33.792	0.063	0.317	1.450	1.767	0.114	1.314	1.428	45,709
UPRR Ave 24	11.498	157.639	28.141	0.053	0.264	1.208	1.472	0.095	1.094	1.189	38,064
Hybrid Ave 24	1.593	21.844	3.900	0.007	0.037	0.167	0.204	0.013	0.152	0.165	5,275
Hybrid Ave 21	6.834	93.694	16.726	0.031	0.157	0.718	0.875	0.057	0.650	0.707	22,624
2015 Construction											
BNSF Ave 21	4.680	64.155	11.452	0.021	0.107	0.492	0.599	0.039	0.445	0.484	15,491
BNSF Ave 24	6.295	86.301	15.406	0.029	0.145	0.661	0.806	0.052	0.599	0.651	20,839
UPRR Ave 21	13.808	189.297	33.792	0.063	0.317	1.450	1.767	0.114	1.314	1.428	45,709
UPRR Ave 24	11.498	157.639	28.141	0.053	0.264	1.208	1.472	0.095	1.094	1.189	38,064
Hybrid Ave 24	1.593	21.844	3.900	0.007	0.037	0.167	0.204	0.013	0.152	0.165	5,275
Hybrid Ave 21	6.834	93.694	16.726	0.031	0.157	0.718	0.875	0.057	0.650	0.707	22,624
2016 Construction											
BNSF Ave 21	4.680	64.155	11.452	0.021	0.107	0.492	0.599	0.039	0.445	0.484	15,491
BNSF Ave 24	6.295	86.301	15.406	0.029	0.145	0.661	0.806	0.052	0.599	0.651	20,839
UPRR Ave 21	13.808	189.297	33.792	0.063	0.317	1.450	1.767	0.114	1.314	1.428	45,709
UPRR Ave 24	11.498	157.639	28.141	0.053	0.264	1.208	1.472	0.095	1.094	1.189	38,064
Hybrid Ave 24	1.593	21.844	3.900	0.007	0.037	0.167	0.204	0.013	0.152	0.165	5,275
Hybrid Ave 21	6.834	93.694	16.726	0.031	0.157	0.718	0.875	0.057	0.650	0.707	22,624
2017 Construction											
BNSF Ave 21	4.680	64.155	11.452	0.021	0.107	0.492	0.599	0.039	0.445	0.484	15,491
BNSF Ave 24	6.295	86.301	15.406	0.029	0.145	0.661	0.806	0.052	0.599	0.651	20,839
UPRR Ave 21	13.808	189.297	33.792	0.063	0.317	1.450	1.767	0.114	1.314	1.428	45,709
UPRR Ave 24	11.498	157.639	28.141	0.053	0.264	1.208	1.472	0.095	1.094	1.189	38,064
Hybrid Ave 24	1.593	21.844	3.900	0.007	0.037	0.167	0.204	0.013	0.152	0.165	5,275
Hybrid Ave 21	6.834	93.694	16.726	0.031	0.157	0.718	0.875	0.057	0.650	0.707	22,624

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of each alternative.

B.1-30 Elevated Structures: Construction Emissions from Concrete Batch Plant Operation

This tab provides the emissions resulting from making concrete to support construction of elevated structures by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Material Hauling' tabs). The data on this tab only applies to structures built as part of the BNSF, UPRR, and Hybrid Alternatives.

Operation Schedule:	June 2013 - December 2017
Operation Duration (years):	4.6
Operational Days per Year :	280

	BNSF Ave 21	BNSF Ave 24	UPRR Ave 21	UPRR Ave 24	Hybrid Ave 24	Hybrid Ave 21
Total Volume of Concrete (cy):	735,721	989,697	2,170,847	1,807,786	250,511	1,074,480
Concrete Batch Plant Rate (cy/day):	573	771	1,692	1,409	195	837

Emission Factors

Process	Uncontrolled PM_{10} EF (lb/ton)	Controlled PM_{10} EF (lb/ton)
Sand Transfer	0.00099	0
Aggregate Transfer	0.0033	0
Cement supplement unloading to storage silo	1.1	0.0049
Weigh hopper loading (lb/ton of aggregate and sand)	0.0024	0
Central Mix - Mixer loading (lb/ton of cement and cement supplement)	0.134	0.0048

Reference: AP42 Chp. 11.12 Concrete Batching. Assume supplement unloading (rather than pnenuamtic) to storage silo since supplement unloading has the higer EF.

Material Compositions

Material	Composition by Weight (lb/cy)
Sand	1,428
Course aggregate	1,865
Cement Supplement	73
Cement	491
Water (gallons / yd)	20
Total Quantity Concrete Produced	4,024

Reference: BAAQMD Permit Handbook 11.5 Concrete Batch Plants

Material Quantities (tons/day)

Material	BNSF Ave 21	BNSF Ave 24	UPRR Ave 21	UPRR Ave 24	Hybrid Ave 24	Hybrid Ave 21
Sand	409	551	1,208	1,006	139	598
Aggregate	535	719	1,577	1,314	182	781
Cement Supplement	21	28	62	51	7	31
Aggregate & Sand	944	1,270	2,785	2,319	321	1,379
Cement & Cement Supplement	162	217	477	397	55	236

Material	BNSF Ave 21		BNSF Ave 24		UPRR Ave 21		UPRR Ave 24		Hybrid Ave 24		Hybrid Ave 21	
	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$
Annual Emissions (tons/year)												
Sand	0.057	0.000	0.076	0.000	0.167	0.000	0.139	0.000	0.019	0.000	0.083	0.000
Aggregate	0.247	0.000	0.332	0.000	0.729	0.000	0.607	0.000	0.084	0.000	0.361	0.000
Cement Supplement	3.222	0.014	4.335	0.019	9.508	0.042	7.918	0.035	1.097	0.005	4.706	0.021
Aggregate & Sand	0.317	0.000	0.427	0.000	0.936	0.000	0.779	0.000	0.108	0.000	0.463	0.000
Cement & Cement Supplement	3.033	0.109	4.080	0.146	8.949	0.321	7.452	0.267	1.033	0.037	4.429	0.159
Total Annual Emissions	**6.876**	**0.123**	**9.250**	**0.165**	**20.289**	**0.363**	**16.896**	**0.302**	**2.341**	**0.042**	**10.042**	**0.180**

Notes:

Assumes that onsite concrete batch plant is used to pour forms. Construction schedule assumes that multiple operations are performed at the same time. Such as pouring concrete forms for one section at the same time as installing them for another section.

Assume onsite concrete plant is only used for the elevated structures and the average amount assumes about the same use through the construction of the elevated structures.

Emissions were estimated based on total throughput; as a result, the emissions are independent of the number of concrete batch plants that may be present during construction.

Conservatively assumed that $PM_{2.5}$ emissions are equal to PM_{10} emissions.

B.1-31 URBEMIS2007 At-Grade Rail: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of at-grade rail that will be scaled on the Alternative Track tabs. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to track built as part of the BNSF, UPRR, and Hybrid Alternatives.

Construction Emissions (Programmatic)

	Emissions (tpy/1,000 ft) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
Quarter 1											
Off-Road Equipment	0.184	0.725	1.523	0.000	0.000	0.069	0.069	0.000	0.063	0.063	206
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.250	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	33
Quarter 2											
Off-Road Equipment	0.182	0.713	1.503	0.000	0.000	0.067	0.067	0.000	0.062	0.062	203
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.254	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 3											
Off-Road Equipment	0.190	0.744	1.579	0.000	0.000	0.070	0.070	0.000	0.065	0.065	215
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 4											
Off-Road Equipment	0.187	0.732	1.548	0.000	0.000	0.069	0.069	0.000	0.064	0.064	210
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q1 [2]	**0.192**	**0.975**	**1.535**	**0.000**	**0.002**	**0.070**	**0.071**	**0.001**	**0.064**	**0.064**	**239**
Total Q2 [2]	**0.189**	**0.967**	**1.516**	**0.000**	**0.002**	**0.068**	**0.070**	**0.001**	**0.062**	**0.063**	**236**
Total Q3 [2]	**0.198**	**1.002**	**1.592**	**0.000**	**0.002**	**0.071**	**0.073**	**0.001**	**0.065**	**0.066**	**249**
Total Q4 [2]	**0.195**	**0.990**	**1.561**	**0.000**	**0.002**	**0.070**	**0.072**	**0.001**	**0.064**	**0.065**	**244**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. Results include Quarters 1 through 4, which assume ballast and rail are laid simultaneously. Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while the track is laid. The Quarters represent the usage of equipment groups over a 3-month period.

Construction Emissions (Mitigated)

	Emissions (tpy/1,000 ft) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
Quarter 1											
Off-Road Equipment [3]	0.067	0.725	0.169	0.000	0.000	0.007	0.007	0.000	0.006	0.006	206
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.250	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	33
Quarter 2											
Off-Road Equipment [3]	0.066	0.713	0.167	0.000	0.000	0.007	0.007	0.000	0.006	0.006	203
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.254	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 3											
Off-Road Equipment [3]	0.069	0.744	0.175	0.000	0.000	0.007	0.007	0.000	0.007	0.007	215
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 4											
Off-Road Equipment [3]	0.068	0.732	0.172	0.000	0.000	0.007	0.007	0.000	0.006	0.006	210
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q1 [4, 5]	**0.074**	**0.975**	**0.182**	**0.000**	**0.002**	**0.008**	**0.009**	**0.001**	**0.007**	**0.008**	**239**
Total Q2 [4, 5]	**0.074**	**0.967**	**0.180**	**0.000**	**0.002**	**0.008**	**0.009**	**0.001**	**0.007**	**0.008**	**236**
Total Q3 [4, 5]	**0.077**	**1.002**	**0.189**	**0.000**	**0.002**	**0.008**	**0.010**	**0.001**	**0.007**	**0.008**	**249**
Total Q4 [4, 5]	**0.076**	**0.990**	**0.185**	**0.000**	**0.002**	**0.008**	**0.010**	**0.001**	**0.007**	**0.008**	**244**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include Quarters 1 through 4, which assume ballast and rail are laid simultaneously. Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while the track is laid. The Quarters represent the usage of equipment groups over a 3-month period.
5. Mitigation applied included using off-road construction equipment that meets Tier 4 standards.

B.1-32 URBEMIS2007 Elevated Rail: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of elevated rail that will be scaled on the Alternative Track tabs. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to track built as part of the BNSF, UPRR, and Hybrid Alternatives.

Construction Emissions (Programmatic)

	Emissions (tpy/1,000 ft) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
Quarter 3											
Off-Road Equipment	0.095	0.339	0.782	0.000	0.000	0.033	0.033	0.000	0.030	0.030	110
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.250	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	33
Quarter 4											
Off-Road Equipment	0.105	0.409	0.812	0.000	0.000	0.042	0.042	0.000	0.038	0.038	110
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.254	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 3											
Off-Road Equipment	0.098	0.350	0.806	0.000	0.000	0.034	0.034	0.000	0.031	0.031	114
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 4											
Off-Road Equipment	0.107	0.416	0.825	0.000	0.000	0.042	0.042	0.000	0.039	0.039	112
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q3 [2]	**0.102**	**0.589**	**0.795**	**0.000**	**0.002**	**0.034**	**0.035**	**0.001**	**0.031**	**0.032**	**144**
Total Q4 [2]	**0.113**	**0.664**	**0.826**	**0.000**	**0.002**	**0.043**	**0.044**	**0.001**	**0.039**	**0.040**	**144**
Total Q3 [2]	**0.105**	**0.608**	**0.820**	**0.000**	**0.002**	**0.035**	**0.036**	**0.001**	**0.032**	**0.033**	**148**
Total Q4 [2]	**0.115**	**0.674**	**0.838**	**0.000**	**0.002**	**0.043**	**0.045**	**0.001**	**0.040**	**0.040**	**146**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. Results include repeating Quarters 3 and 4 (laying rail). Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while the track is laid. The Quarters represent the usage of equipment groups over a 3-month period.

Construction Emissions (Mitigated)

	Emissions (tpy/1,000 ft) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
Quarter 3											
Off-Road Equipment [3]	0.034	0.339	0.087	0.000	0.000	0.003	0.003	0.000	0.003	0.003	110
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.250	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	33
Quarter 4											
Off-Road Equipment [3]	0.038	0.409	0.090	0.000	0.000	0.004	0.004	0.000	0.004	0.004	110
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.254	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 3											
Off-Road Equipment [3]	0.035	0.350	0.090	0.000	0.000	0.003	0.003	0.000	0.003	0.003	114
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 4											
Off-Road Equipment [3]	0.039	0.416	0.092	0.000	0.000	0.004	0.004	0.000	0.004	0.004	112
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.008	0.258	0.013	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q3 [4, 5]	**0.042**	**0.589**	**0.100**	**0.000**	**0.002**	**0.004**	**0.006**	**0.001**	**0.004**	**0.004**	**144**
Total Q4 [4, 5]	**0.046**	**0.664**	**0.103**	**0.000**	**0.002**	**0.005**	**0.007**	**0.001**	**0.005**	**0.005**	**144**
Total Q3 [4, 5]	**0.043**	**0.608**	**0.103**	**0.000**	**0.002**	**0.004**	**0.006**	**0.001**	**0.004**	**0.005**	**148**
Total Q4 [4, 5]	**0.047**	**0.674**	**0.105**	**0.000**	**0.002**	**0.005**	**0.007**	**0.001**	**0.005**	**0.005**	**146**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include repeating Quarters 3 and 4 (laying rail). Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while track is laid. The Quarters represent the usage of equipment groups over a 3-month period.
5. Mitigation applied included using off-road construction equipment that meets Tier 4 standards.

B.1-33 BNSF Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the BNSF Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	79.829	405.603	639.572	0.135	0.677	28.737	29.415	0.244	26.394	26.639	99,852
Elevated Rail	8.734	50.856	65.783	0.026	0.132	3.101	3.233	0.048	2.845	2.892	11,655
Retained Fill Rail [2]	1.445	8.412	10.881	0.004	0.022	0.513	0.535	0.008	0.471	0.478	1,928
2015 Construction											
At-Grade Rail	79.829	405.603	639.572	0.135	0.677	28.737	29.415	0.244	26.394	26.639	99,852
Elevated Rail	8.734	50.856	65.783	0.026	0.132	3.101	3.233	0.048	2.845	2.892	11,655
Retained Fill Rail [2]	1.445	8.412	10.881	0.004	0.022	0.513	0.535	0.008	0.471	0.478	1,928
2016 Construction											
At-Grade Rail	79.829	405.603	639.572	0.135	0.677	28.737	29.415	0.244	26.394	26.639	99,852
Elevated Rail	8.734	50.856	65.783	0.026	0.132	3.101	3.233	0.048	2.845	2.892	11,655
Retained Fill Rail [2]	1.445	8.412	10.881	0.004	0.022	0.513	0.535	0.008	0.471	0.478	1,928
2017 Construction [3]											
At-Grade Rail	59.748	303.519	478.644	0.101	0.506	21.513	22.019	0.183	19.759	19.942	74,660
Elevated Rail	6.434	37.334	48.963	0.020	0.099	2.232	2.330	0.036	2.047	2.082	8,730
Retained Fill Rail [2]	1.064	6.175	8.099	0.003	0.016	0.369	0.385	0.006	0.339	0.344	1,444
2014 Total	**90.007**	**464.871**	**716.236**	**0.166**	**0.831**	**32.351**	**33.182**	**0.300**	**29.709**	**30.009**	**113,434**
2015 Total	**90.007**	**464.871**	**716.236**	**0.166**	**0.831**	**32.351**	**33.182**	**0.300**	**29.709**	**30.009**	**113,434**
2016 Total	**90.007**	**464.871**	**716.236**	**0.166**	**0.831**	**32.351**	**33.182**	**0.300**	**29.709**	**30.009**	**113,434**
2017 Total	**67.245**	**347.028**	**535.706**	**0.124**	**0.621**	**24.114**	**24.735**	**0.224**	**22.144**	**22.369**	**84,833**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.

B.1-33 BNSF Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the BNSF Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	30.976	405.603	75.797	0.135	0.677	3.263	3.941	0.244	2.958	3.203	99,852
Elevated Rail	3.563	50.856	8.238	0.026	0.132	0.383	0.514	0.048	0.343	0.391	11,655
Retained Fill Rail [2]	0.589	8.412	1.363	0.004	0.022	0.063	0.085	0.008	0.057	0.065	1,928
2015 Construction											
At-Grade Rail	30.976	405.603	75.797	0.135	0.677	3.263	3.941	0.244	2.958	3.203	99,852
Elevated Rail	3.563	50.856	8.238	0.026	0.132	0.383	0.514	0.048	0.343	0.391	11,655
Retained Fill Rail [2]	0.589	8.412	1.363	0.004	0.022	0.063	0.085	0.008	0.057	0.065	1,928
2016 Construction											
At-Grade Rail	30.976	405.603	75.797	0.135	0.677	3.263	3.941	0.244	2.958	3.203	99,852
Elevated Rail	3.563	50.856	8.238	0.026	0.132	0.383	0.514	0.048	0.343	0.391	11,655
Retained Fill Rail [2]	0.589	8.412	1.363	0.004	0.022	0.063	0.085	0.008	0.057	0.065	1,928
2017 Construction [3]											
At-Grade Rail	23.181	303.519	56.719	0.101	0.506	2.443	2.949	0.183	2.214	2.397	74,660
Elevated Rail	2.629	37.334	6.134	0.020	0.099	0.277	0.376	0.036	0.249	0.284	8,730
Retained Fill Rail [2]	0.435	6.175	1.015	0.003	0.016	0.046	0.062	0.006	0.041	0.047	1,444
2014 Total [4]	**35.129**	**464.871**	**85.398**	**0.166**	**0.831**	**3.709**	**4.540**	**0.300**	**3.358**	**3.658**	**113,434**
2015 Total [4]	**35.129**	**464.871**	**85.398**	**0.166**	**0.831**	**3.709**	**4.540**	**0.300**	**3.358**	**3.658**	**113,434**
2016 Total [4]	**35.129**	**464.871**	**85.398**	**0.166**	**0.831**	**3.709**	**4.540**	**0.300**	**3.358**	**3.658**	**113,434**
2017 Total [4]	**26.245**	**347.028**	**63.868**	**0.124**	**0.621**	**2.766**	**3.386**	**0.224**	**2.504**	**2.728**	**84,833**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.
4. Results include mitigation measures, as discussed on the 'URBEMIS At-Grade Rail' and 'URBEMIS Elev. Rail' tabs.

B.1-33 BNSF Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the BNSF Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Fugitive Dust Emissions from Track Construction

Parameter	Value	Comments
Length of Alternative (ft)	431,357	Refer to 'Alternatives' tab
Width of Alternative (ft)	120	Refer to 'Alignment' tab of the Data Request
Total Area Disturbed (acres)	1,188	Calculated; see notes below.
Laying Track Duration (years)	3.7	Refer to 'Schedule' tab of the Data Request
Area Disturbed per Day (acre/day)	1.2	Calculated; see notes below.
PM_{10} Emission Factor (lbs/acre/day) [1, 2]	10	Appendix A, Table A-4 of the URBEMIS2007 User Guide (2007)
PM_{10} Emissions (lbs/day) [3]	11.574	Calculated; see notes below.
PM_{10} Emissions (tpy) [3]	1.620	Calculated; see notes below.
$PM_{2.5}$ Emissions (lbs/day) [3, 4]	2.407	Calculated; see notes below.
$PM_{2.5}$ Emissions (tpy) [3, 4]	0.337	Calculated; see notes below.

Notes:

Conversion Factor: 1 acre =	43,560	square feet
Working Days per Year =	280	Assumed; consistent with material hauling estimations
Conversion Factor: 1 ton =	2,000	lbs

1. Emission factor assumes watering twice daily per the programmatic measures.
2. A grading emission factor was used to conservatively represent the PM emissions from track construction activities.
3. As a conservative approach, mitigated emissions were assumed equal to unmitigated emissions.
4. Assumed $PM_{2.5}$ emissions were 20.8% of the PM_{10} emissions,
based on the construction data provided in Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

B.1-34 BNSF Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the BNSF Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	76.444	388.402	612.449	0.129	0.649	27.519	28.167	0.234	25.275	25.509	95,617
Elevated Rail	11.748	68.412	88.491	0.035	0.177	4.172	4.349	0.064	3.826	3.890	15,678
Retained Fill Rail [2]	1.445	8.412	10.881	0.004	0.022	0.513	0.535	0.008	0.471	0.478	1,928
2015 Construction											
At-Grade Rail	76.444	388.402	612.449	0.129	0.649	27.519	28.167	0.234	25.275	25.509	95,617
Elevated Rail	11.748	68.412	88.491	0.035	0.177	4.172	4.349	0.064	3.826	3.890	15,678
Retained Fill Rail [2]	1.445	8.412	10.881	0.004	0.022	0.513	0.535	0.008	0.471	0.478	1,928
2016 Construction											
At-Grade Rail	76.444	388.402	612.449	0.129	0.649	27.519	28.167	0.234	25.275	25.509	95,617
Elevated Rail	11.748	68.412	88.491	0.035	0.177	4.172	4.349	0.064	3.826	3.890	15,678
Retained Fill Rail [2]	1.445	8.412	10.881	0.004	0.022	0.513	0.535	0.008	0.471	0.478	1,928
2017 Construction [3]											
At-Grade Rail	57.214	290.648	458.346	0.097	0.485	20.601	21.085	0.175	18.921	19.096	71,494
Elevated Rail	8.654	50.222	65.865	0.026	0.133	3.002	3.134	0.048	2.753	2.801	11,743
Retained Fill Rail [2]	1.064	6.175	8.099	0.003	0.016	0.369	0.385	0.006	0.339	0.344	1,444
2014 Total	**89.637**	**465.226**	**711.821**	**0.169**	**0.848**	**32.203**	**33.051**	**0.306**	**29.572**	**29.878**	**113,223**
2015 Total	**89.637**	**465.226**	**711.821**	**0.169**	**0.848**	**32.203**	**33.051**	**0.306**	**29.572**	**29.878**	**113,223**
2016 Total	**89.637**	**465.226**	**711.821**	**0.169**	**0.848**	**32.203**	**33.051**	**0.306**	**29.572**	**29.878**	**113,223**
2017 Total	**66.933**	**347.045**	**532.310**	**0.126**	**0.633**	**23.972**	**24.605**	**0.229**	**22.013**	**22.242**	**84,681**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.

B.1-34 BNSF Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the BNSF Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	29.663	388.402	72.583	0.129	0.649	3.125	3.774	0.234	2.833	3.067	95,617
Elevated Rail	4.793	68.412	11.082	0.035	0.177	0.515	0.692	0.064	0.462	0.526	15,678
Retained Fill Rail [2]	0.589	8.412	1.363	0.004	0.022	0.063	0.085	0.008	0.057	0.065	1,928
2015 Construction											
At-Grade Rail	29.663	388.402	72.583	0.129	0.649	3.125	3.774	0.234	2.833	3.067	95,617
Elevated Rail	4.793	68.412	11.082	0.035	0.177	0.515	0.692	0.064	0.462	0.526	15,678
Retained Fill Rail [2]	0.589	8.412	1.363	0.004	0.022	0.063	0.085	0.008	0.057	0.065	1,928
2016 Construction											
At-Grade Rail	29.663	388.402	72.583	0.129	0.649	3.125	3.774	0.234	2.833	3.067	95,617
Elevated Rail	4.793	68.412	11.082	0.035	0.177	0.515	0.692	0.064	0.462	0.526	15,678
Retained Fill Rail [2]	0.589	8.412	1.363	0.004	0.022	0.063	0.085	0.008	0.057	0.065	1,928
2017 Construction [3]											
At-Grade Rail	22.198	290.648	54.314	0.097	0.485	2.339	2.824	0.175	2.120	2.295	71,494
Elevated Rail	3.536	50.222	8.252	0.026	0.133	0.373	0.505	0.048	0.334	0.382	11,743
Retained Fill Rail [2]	0.435	6.175	1.015	0.003	0.016	0.046	0.062	0.006	0.041	0.047	1,444
2014 Total [4]	**35.045**	**465.226**	**85.027**	**0.169**	**0.848**	**3.703**	**4.551**	**0.306**	**3.352**	**3.657**	**113,223**
2015 Total [4]	**35.045**	**465.226**	**85.027**	**0.169**	**0.848**	**3.703**	**4.551**	**0.306**	**3.352**	**3.657**	**113,223**
2016 Total [4]	**35.045**	**465.226**	**85.027**	**0.169**	**0.848**	**3.703**	**4.551**	**0.306**	**3.352**	**3.657**	**113,223**
2017 Total [4]	**26.170**	**347.045**	**63.580**	**0.126**	**0.633**	**2.758**	**3.391**	**0.229**	**2.496**	**2.724**	**84,681**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.
4. Results include mitigation measures, as discussed on the 'URBEMIS At-Grade Rail' and 'URBEMIS Elev. Rail' tabs.

B.1-34 BNSF Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the BNSF Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Fugitive Dust Emissions from Track Construction

Parameter	Value	Comments
Length of Alternative (ft)	442,681	Refer to 'Alternatives' tab
Width of Alternative (ft)	120	Refer to 'Alignment' tab of the Data Request
Total Area Disturbed (acres)	1,220	Calculated; see notes below.
Laying Track Duration (years)	3.7	Refer to 'Schedule' tab of the Data Request
Area Disturbed per Day (acre/day)	1.2	Calculated; see notes below.
PM_{10} Emission Factor (lbs/acre/day) [1, 2]	10	Appendix A, Table A-4 of the URBEMIS2007 User Guide (2007)
PM_{10} Emissions (lbs/day) [3]	11.878	Calculated; see notes below.
PM_{10} Emissions (tpy) [3]	1.663	Calculated; see notes below.
$PM_{2.5}$ Emissions (lbs/day) [3, 4]	2.471	Calculated; see notes below.
$PM_{2.5}$ Emissions (tpy) [3, 4]	0.346	Calculated; see notes below.

Notes:

Conversion Factor: 1 acre =	43,560	square feet
Working Days per Year =	280	Assumed; consistent with material hauling estimations
Conversion Factor: 1 ton =	2,000	lbs

1. Emission factor assumes watering twice daily per the programmatic measures.
2. A grading emission factor was used to conservatively represent the PM emissions from track construction activities.
3. As a conservative approach, mitigated emissions were assumed equal to unmitigated emissions.
4. Assumed $PM_{2.5}$ emissions were 20.8% of the PM_{10} emissions,
based on the construction data provided in Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

B.1-35 UPRR Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the UPRR Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	42.575	216.317	341.098	0.072	0.361	15.326	15.687	0.130	14.077	14.207	53,253
Elevated Rail	25.770	150.057	194.100	0.078	0.389	9.150	9.539	0.140	8.393	8.533	34,389
Retained Fill Rail [2]	1.083	6.305	8.155	0.003	0.016	0.384	0.401	0.006	0.353	0.359	1,445
2015 Construction											
At-Grade Rail	42.575	216.317	341.098	0.072	0.361	15.326	15.687	0.130	14.077	14.207	53,253
Elevated Rail	25.770	150.057	194.100	0.078	0.389	9.150	9.539	0.140	8.393	8.533	34,389
Retained Fill Rail [2]	1.083	6.305	8.155	0.003	0.016	0.384	0.401	0.006	0.353	0.359	1,445
2016 Construction											
At-Grade Rail	42.575	216.317	341.098	0.072	0.361	15.326	15.687	0.130	14.077	14.207	53,253
Elevated Rail	25.770	150.057	194.100	0.078	0.389	9.150	9.539	0.140	8.393	8.533	34,389
Retained Fill Rail [2]	1.083	6.305	8.155	0.003	0.016	0.384	0.401	0.006	0.353	0.359	1,445
2017 Construction [3]											
At-Grade Rail	31.865	161.874	255.271	0.054	0.270	11.473	11.743	0.097	10.538	10.635	39,818
Elevated Rail	18.983	110.158	144.472	0.058	0.291	6.585	6.875	0.105	6.039	6.144	25,758
Retained Fill Rail [2]	0.798	4.628	6.070	0.002	0.012	0.277	0.289	0.004	0.254	0.258	1,082
2014 Total	**69.427**	**372.679**	**543.354**	**0.153**	**0.767**	**24.861**	**25.628**	**0.277**	**22.822**	**23.099**	**89,087**
2015 Total	**69.427**	**372.679**	**543.354**	**0.153**	**0.767**	**24.861**	**25.628**	**0.277**	**22.822**	**23.099**	**89,087**
2016 Total	**69.427**	**372.679**	**543.354**	**0.153**	**0.767**	**24.861**	**25.628**	**0.277**	**22.822**	**23.099**	**89,087**
2017 Total	**51.646**	**276.660**	**405.813**	**0.114**	**0.573**	**18.335**	**18.908**	**0.207**	**16.831**	**17.037**	**66,658**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.

B.1-35 UPRR Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the UPRR Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	16.520	216.317	40.424	0.072	0.361	1.740	2.102	0.130	1.578	1.708	53,253
Elevated Rail	10.513	150.057	24.307	0.078	0.389	1.129	1.518	0.140	1.013	1.154	34,389
Retained Fill Rail [2]	0.442	6.305	1.021	0.003	0.016	0.047	0.064	0.006	0.043	0.048	1,445
2015 Construction											
At-Grade Rail	16.520	216.317	40.424	0.072	0.361	1.740	2.102	0.130	1.578	1.708	53,253
Elevated Rail	10.513	150.057	24.307	0.078	0.389	1.129	1.518	0.140	1.013	1.154	34,389
Retained Fill Rail [2]	0.442	6.305	1.021	0.003	0.016	0.047	0.064	0.006	0.043	0.048	1,445
2016 Construction											
At-Grade Rail	16.520	216.317	40.424	0.072	0.361	1.740	2.102	0.130	1.578	1.708	53,253
Elevated Rail	10.513	150.057	24.307	0.078	0.389	1.129	1.518	0.140	1.013	1.154	34,389
Retained Fill Rail [2]	0.442	6.305	1.021	0.003	0.016	0.047	0.064	0.006	0.043	0.048	1,445
2017 Construction [3]											
At-Grade Rail	12.363	161.874	30.250	0.054	0.270	1.303	1.573	0.097	1.181	1.278	39,818
Elevated Rail	7.757	110.158	18.100	0.058	0.291	0.818	1.108	0.105	0.733	0.838	25,758
Retained Fill Rail [2]	0.326	4.628	0.760	0.002	0.012	0.034	0.047	0.004	0.031	0.035	1,082
2014 Total [4]	**27.476**	**372.679**	**65.753**	**0.153**	**0.767**	**2.917**	**3.683**	**0.277**	**2.633**	**2.910**	**89,087**
2015 Total [4]	**27.476**	**372.679**	**65.753**	**0.153**	**0.767**	**2.917**	**3.683**	**0.277**	**2.633**	**2.910**	**89,087**
2016 Total [4]	**27.476**	**372.679**	**65.753**	**0.153**	**0.767**	**2.917**	**3.683**	**0.277**	**2.633**	**2.910**	**89,087**
2017 Total [4]	**20.446**	**276.660**	**49.110**	**0.114**	**0.573**	**2.155**	**2.728**	**0.207**	**1.945**	**2.152**	**66,658**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.
4. Results include mitigation measures, as discussed on the 'URBEMIS At-Grade Rail' and 'URBEMIS Elev. Rail' tabs.

B.1-35 UPRR Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the UPRR Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Fugitive Dust Emissions from Track Construction

Parameter	Value	Comments
Length of Alternative (ft)	381,828	Refer to 'Alternatives' tab
Width of Alternative (ft)	120	Refer to 'Alignment' tab of the Data Request
Total Area Disturbed (acres)	1,052	Calculated; see notes below.
Laying Track Duration (years)	3.7	Refer to 'Schedule' tab of the Data Request
Area Disturbed per Day (acre/day)	1.0	Calculated; see notes below.
PM_{10} Emission Factor (lbs/acre/day) [1, 2]	10	Appendix A, Table A-4 of the URBEMIS2007 User Guide (2007)
PM_{10} Emissions (lbs/day) [3]	10.245	Calculated; see notes below.
PM_{10} Emissions (tpy) [3]	1.434	Calculated; see notes below.
$PM_{2.5}$ Emissions (lbs/day) [3, 4]	2.131	Calculated; see notes below.
$PM_{2.5}$ Emissions (tpy) [3, 4]	0.298	Calculated; see notes below.

Notes:

Conversion Factor: 1 acre =	43,560	square feet
Working Days per Year =	280	Assumed; consistent with material hauling estimations
Conversion Factor: 1 ton =	2,000	lbs

1. Emission factor assumes watering twice daily per the programmatic measures.
2. A grading emission factor was used to conservatively represent the PM emissions from track construction activities.
3. As a conservative approach, mitigated emissions were assumed equal to unmitigated emissions.
4. Assumed $PM_{2.5}$ emissions were 20.8% of the PM_{10} emissions,
based on the construction data provided in Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

B.1-36 UPRR Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the UPRR Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	52.506	266.778	420.667	0.089	0.445	18.901	19.347	0.161	17.360	17.521	65,676
Elevated Rail	21.460	124.961	161.638	0.065	0.324	7.620	7.944	0.117	6.989	7.106	28,638
Retained Fill Rail [2]	1.094	6.371	8.241	0.003	0.017	0.389	0.405	0.006	0.356	0.362	1,460
2015 Construction											
At-Grade Rail	52.506	266.778	420.667	0.089	0.445	18.901	19.347	0.161	17.360	17.521	65,676
Elevated Rail	21.460	124.961	161.638	0.065	0.324	7.620	7.944	0.117	6.989	7.106	28,638
Retained Fill Rail [2]	1.094	6.371	8.241	0.003	0.017	0.389	0.405	0.006	0.356	0.362	1,460
2016 Construction											
At-Grade Rail	52.506	266.778	420.667	0.089	0.445	18.901	19.347	0.161	17.360	17.521	65,676
Elevated Rail	21.460	124.961	161.638	0.065	0.324	7.620	7.944	0.117	6.989	7.106	28,638
Retained Fill Rail [2]	1.094	6.371	8.241	0.003	0.017	0.389	0.405	0.006	0.356	0.362	1,460
2017 Construction [3]											
At-Grade Rail	39.298	199.635	314.820	0.066	0.333	14.150	14.483	0.120	12.996	13.116	49,106
Elevated Rail	15.808	91.735	120.310	0.048	0.242	5.483	5.725	0.087	5.029	5.116	21,450
Retained Fill Rail [2]	0.806	4.677	6.134	0.002	0.012	0.280	0.292	0.004	0.256	0.261	1,094
2014 Total	**75.060**	**398.110**	**590.547**	**0.157**	**0.786**	**26.910**	**27.696**	**0.284**	**24.706**	**24.990**	**95,773**
2015 Total	**75.060**	**398.110**	**590.547**	**0.157**	**0.786**	**26.910**	**27.696**	**0.284**	**24.706**	**24.990**	**95,773**
2016 Total	**75.060**	**398.110**	**590.547**	**0.157**	**0.786**	**26.910**	**27.696**	**0.284**	**24.706**	**24.990**	**95,773**
2017 Total	**55.912**	**296.047**	**441.263**	**0.117**	**0.587**	**19.913**	**20.500**	**0.212**	**18.282**	**18.494**	**71,650**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.

B.1-36 UPRR Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the UPRR Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	20.374	266.778	49.854	0.089	0.445	2.146	2.592	0.161	1.946	2.107	65,676
Elevated Rail	8.755	124.961	20.242	0.065	0.324	0.940	1.264	0.117	0.844	0.961	28,638
Retained Fill Rail [2]	0.446	6.371	1.032	0.003	0.017	0.048	0.064	0.006	0.043	0.049	1,460
2015 Construction											
At-Grade Rail	20.374	266.778	49.854	0.089	0.445	2.146	2.592	0.161	1.946	2.107	65,676
Elevated Rail	8.755	124.961	20.242	0.065	0.324	0.940	1.264	0.117	0.844	0.961	28,638
Retained Fill Rail [2]	0.446	6.371	1.032	0.003	0.017	0.048	0.064	0.006	0.043	0.049	1,460
2016 Construction											
At-Grade Rail	20.374	266.778	49.854	0.089	0.445	2.146	2.592	0.161	1.946	2.107	65,676
Elevated Rail	8.755	124.961	20.242	0.065	0.324	0.940	1.264	0.117	0.844	0.961	28,638
Retained Fill Rail [2]	0.446	6.371	1.032	0.003	0.017	0.048	0.064	0.006	0.043	0.049	1,460
2017 Construction [3]											
At-Grade Rail	15.247	199.635	37.306	0.066	0.333	1.607	1.939	0.120	1.456	1.576	49,106
Elevated Rail	6.460	91.735	15.073	0.048	0.242	0.681	0.923	0.087	0.611	0.698	21,450
Retained Fill Rail [2]	0.329	4.677	0.768	0.002	0.012	0.035	0.047	0.004	0.031	0.036	1,094
2014 Total [4]	**29.576**	**398.110**	**71.128**	**0.157**	**0.786**	**3.134**	**3.920**	**0.284**	**2.833**	**3.116**	**95,773**
2015 Total [4]	**29.576**	**398.110**	**71.128**	**0.157**	**0.786**	**3.134**	**3.920**	**0.284**	**2.833**	**3.116**	**95,773**
2016 Total [4]	**29.576**	**398.110**	**71.128**	**0.157**	**0.786**	**3.134**	**3.920**	**0.284**	**2.833**	**3.116**	**95,773**
2017 Total [4]	**22.036**	**296.047**	**53.148**	**0.117**	**0.587**	**2.322**	**2.909**	**0.212**	**2.098**	**2.310**	**71,650**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.
4. Results include mitigation measures, as discussed on the 'URBEMIS At-Grade Rail' and 'URBEMIS Elev. Rail' tabs.

B.1-36 UPRR Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the UPRR Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Fugitive Dust Emissions from Track Construction

Parameter	Value	Comments
Length of Alternative (ft)	392,636	Refer to 'Alternatives' tab
Width of Alternative (ft)	120	Refer to 'Alignment' tab of the Data Request
Total Area Disturbed (acres)	1,082	Calculated; see notes below.
Laying Track Duration (years)	3.7	Refer to 'Schedule' tab of the Data Request
Area Disturbed per Day (acre/day)	1.1	Calculated; see notes below.
PM_{10} Emission Factor (lbs/acre/day) [1, 2]	10	Appendix A, Table A-4 of the URBEMIS2007 User Guide (2007)
PM_{10} Emissions (lbs/day) [3]	10.535	Calculated; see notes below.
PM_{10} Emissions (tpy) [3]	1.475	Calculated; see notes below.
$PM_{2.5}$ Emissions (lbs/day) [3, 4]	2.191	Calculated; see notes below.
$PM_{2.5}$ Emissions (tpy) [3, 4]	0.307	Calculated; see notes below.

Notes:

Conversion Factor: 1 acre =	43,560	square feet
Working Days per Year =	280	Assumed; consistent with material hauling estimations
Conversion Factor: 1 ton =	2,000	lbs

1. Emission factor assumes watering twice daily per the programmatic measures.
2. A grading emission factor was used to conservatively represent the PM emissions from track construction activities.
3. As a conservative approach, mitigated emissions were assumed equal to unmitigated emissions.
4. Assumed $PM_{2.5}$ emissions were 20.8% of the PM_{10} emissions,
based on the construction data provided in Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

B.1-37 Hybrid Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the Hybrid Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	70.295	357.161	563.187	0.119	0.596	25.305	25.902	0.215	23.242	23.457	87,926
Elevated Rail	2.974	17.316	22.399	0.009	0.045	1.056	1.101	0.016	0.969	0.985	3,968
Retained Fill Rail [2]	1.070	6.233	8.062	0.003	0.016	0.380	0.396	0.006	0.349	0.354	1,428
2015 Construction											
At-Grade Rail	70.295	357.161	563.187	0.119	0.596	25.305	25.902	0.215	23.242	23.457	87,926
Elevated Rail	2.974	17.316	22.399	0.009	0.045	1.056	1.101	0.016	0.969	0.985	3,968
Retained Fill Rail [2]	1.070	6.233	8.062	0.003	0.016	0.380	0.396	0.006	0.349	0.354	1,428
2016 Construction											
At-Grade Rail	70.295	357.161	563.187	0.119	0.596	25.305	25.902	0.215	23.242	23.457	87,926
Elevated Rail	2.974	17.316	22.399	0.009	0.045	1.056	1.101	0.016	0.969	0.985	3,968
Retained Fill Rail [2]	1.070	6.233	8.062	0.003	0.016	0.380	0.396	0.006	0.349	0.354	1,428
2017 Construction [3]											
At-Grade Rail	52.612	267.270	421.479	0.089	0.446	18.944	19.389	0.161	17.399	17.560	65,743
Elevated Rail	2.191	12.712	16.672	0.007	0.034	0.760	0.793	0.012	0.697	0.709	2,972
Retained Fill Rail [2]	0.788	4.575	6.001	0.002	0.012	0.273	0.286	0.004	0.251	0.255	1,070
2014 Total	**74.339**	**380.710**	**593.648**	**0.131**	**0.657**	**26.741**	**27.399**	**0.237**	**24.559**	**24.796**	**93,323**
2015 Total	**74.339**	**380.710**	**593.648**	**0.131**	**0.657**	**26.741**	**27.399**	**0.237**	**24.559**	**24.796**	**93,323**
2016 Total	**74.339**	**380.710**	**593.648**	**0.131**	**0.657**	**26.741**	**27.399**	**0.237**	**24.559**	**24.796**	**93,323**
2017 Total	**55.591**	**284.557**	**444.151**	**0.098**	**0.491**	**19.977**	**20.468**	**0.177**	**18.347**	**18.524**	**69,785**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.

B.1-37 Hybrid Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the Hybrid Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	27.277	357.161	66.745	0.119	0.596	2.874	3.470	0.215	2.605	2.820	87,926
Elevated Rail	1.213	17.316	2.805	0.009	0.045	0.130	0.175	0.016	0.117	0.133	3,968
Retained Fill Rail [2]	0.437	6.233	1.010	0.003	0.016	0.047	0.063	0.006	0.042	0.048	1,428
2015 Construction											
At-Grade Rail	27.277	357.161	66.745	0.119	0.596	2.874	3.470	0.215	2.605	2.820	87,926
Elevated Rail	1.213	17.316	2.805	0.009	0.045	0.130	0.175	0.016	0.117	0.133	3,968
Retained Fill Rail [2]	0.437	6.233	1.010	0.003	0.016	0.047	0.063	0.006	0.042	0.048	1,428
2016 Construction											
At-Grade Rail	27.277	357.161	66.745	0.119	0.596	2.874	3.470	0.215	2.605	2.820	87,926
Elevated Rail	1.213	17.316	2.805	0.009	0.045	0.130	0.175	0.016	0.117	0.133	3,968
Retained Fill Rail [2]	0.437	6.233	1.010	0.003	0.016	0.047	0.063	0.006	0.042	0.048	1,428
2017 Construction [3]											
At-Grade Rail	20.413	267.270	49.945	0.089	0.446	2.151	2.596	0.161	1.950	2.111	65,743
Elevated Rail	0.895	12.712	2.089	0.007	0.034	0.094	0.128	0.012	0.085	0.097	2,972
Retained Fill Rail [2]	0.322	4.575	0.752	0.002	0.012	0.034	0.046	0.004	0.030	0.035	1,070
2014 Total [4]	**28.927**	**380.710**	**70.559**	**0.131**	**0.657**	**3.051**	**3.708**	**0.237**	**2.764**	**3.001**	**93,323**
2015 Total [4]	**28.927**	**380.710**	**70.559**	**0.131**	**0.657**	**3.051**	**3.708**	**0.237**	**2.764**	**3.001**	**93,323**
2016 Total [4]	**28.927**	**380.710**	**70.559**	**0.131**	**0.657**	**3.051**	**3.708**	**0.237**	**2.764**	**3.001**	**93,323**
2017 Total [4]	**21.630**	**284.557**	**52.786**	**0.098**	**0.491**	**2.279**	**2.770**	**0.177**	**2.065**	**2.242**	**69,785**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.
4. Results include mitigation measures, as discussed on the 'URBEMIS At-Grade Rail' and 'URBEMIS Elev. Rail' tabs.

B.1-37 Hybrid Ave 24: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the Hybrid Ave 24 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Fugitive Dust Emissions from Track Construction

Parameter	Value	Comments
Length of Alternative (ft)	338,349	Refer to 'Alternatives' tab
Width of Alternative (ft)	120	Refer to 'Alignment' tab of the Data Request
Total Area Disturbed (acres)	932	Calculated; see notes below.
Laying Track Duration (years)	3.7	Refer to 'Schedule' tab of the Data Request
Area Disturbed per Day (acre/day)	0.9	Calculated; see notes below.
PM_{10} Emission Factor (lbs/acre/day) [1, 2]	10	Appendix A, Table A-4 of the URBEMIS2007 User Guide (2007)
PM_{10} Emissions (lbs/day) [3]	9.079	Calculated; see notes below.
PM_{10} Emissions (tpy) [3]	1.271	Calculated; see notes below.
$PM_{2.5}$ Emissions (lbs/day) [3, 4]	1.888	Calculated; see notes below.
$PM_{2.5}$ Emissions (tpy) [3, 4]	0.264	Calculated; see notes below.

Notes:

Conversion Factor: 1 acre =	43,560	square feet
Working Days per Year =	280	Assumed; consistent with material hauling estimations
Conversion Factor: 1 ton =	2,000	lbs

1. Emission factor assumes watering twice daily per the programmatic measures.

2. A grading emission factor was used to conservatively represent the PM emissions from track construction activities.

3. As a conservative approach, mitigated emissions were assumed equal to unmitigated emissions.

4. Assumed $PM_{2.5}$ emissions were 20.8% of the PM_{10} emissions,
based on the construction data provided in Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

B.1-38 Hybrid Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the Hybrid Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	61.787	313.931	495.020	0.104	0.524	22.242	22.767	0.189	20.429	20.618	77,284
Elevated Rail	12.755	74.272	96.072	0.038	0.193	4.529	4.722	0.069	4.154	4.224	17,021
Retained Fill Rail [2]	1.070	6.233	8.062	0.003	0.016	0.380	0.396	0.006	0.349	0.354	1,428
2015 Construction											
At-Grade Rail	61.787	313.931	495.020	0.104	0.524	22.242	22.767	0.189	20.429	20.618	77,284
Elevated Rail	12.755	74.272	96.072	0.038	0.193	4.529	4.722	0.069	4.154	4.224	17,021
Retained Fill Rail [2]	1.070	6.233	8.062	0.003	0.016	0.380	0.396	0.006	0.349	0.354	1,428
2016 Construction											
At-Grade Rail	61.787	313.931	495.020	0.104	0.524	22.242	22.767	0.189	20.429	20.618	77,284
Elevated Rail	12.755	74.272	96.072	0.038	0.193	4.529	4.722	0.069	4.154	4.224	17,021
Retained Fill Rail [2]	1.070	6.233	8.062	0.003	0.016	0.380	0.396	0.006	0.349	0.354	1,428
2017 Construction [3]											
At-Grade Rail	46.244	234.920	370.464	0.078	0.392	16.651	17.043	0.141	15.293	15.435	57,786
Elevated Rail	9.396	54.524	71.507	0.029	0.144	3.259	3.403	0.052	2.989	3.041	12,749
Retained Fill Rail [2]	0.788	4.575	6.001	0.002	0.012	0.273	0.286	0.004	0.251	0.255	1,070
2014 Total	**75.612**	**394.435**	**599.153**	**0.146**	**0.733**	**27.151**	**27.884**	**0.264**	**24.932**	**25.196**	**95,733**
2015 Total	**75.612**	**394.435**	**599.153**	**0.146**	**0.733**	**27.151**	**27.884**	**0.264**	**24.932**	**25.196**	**95,733**
2016 Total	**75.612**	**394.435**	**599.153**	**0.146**	**0.733**	**27.151**	**27.884**	**0.264**	**24.932**	**25.196**	**95,733**
2017 Total	**56.428**	**294.019**	**447.972**	**0.109**	**0.548**	**20.184**	**20.731**	**0.198**	**18.533**	**18.731**	**71,605**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.

B.1-38 Hybrid Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the Hybrid Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Construction Emissions (Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
At-Grade Rail	23.975	313.931	58.666	0.104	0.524	2.526	3.050	0.189	2.290	2.479	77,284
Elevated Rail	5.204	74.272	12.031	0.038	0.193	0.559	0.751	0.069	0.501	0.571	17,021
Retained Fill Rail [2]	0.437	6.233	1.010	0.003	0.016	0.047	0.063	0.006	0.042	0.048	1,428
2015 Construction											
At-Grade Rail	23.975	313.931	58.666	0.104	0.524	2.526	3.050	0.189	2.290	2.479	77,284
Elevated Rail	5.204	74.272	12.031	0.038	0.193	0.559	0.751	0.069	0.501	0.571	17,021
Retained Fill Rail [2]	0.437	6.233	1.010	0.003	0.016	0.047	0.063	0.006	0.042	0.048	1,428
2016 Construction											
At-Grade Rail	23.975	313.931	58.666	0.104	0.524	2.526	3.050	0.189	2.290	2.479	77,284
Elevated Rail	5.204	74.272	12.031	0.038	0.193	0.559	0.751	0.069	0.501	0.571	17,021
Retained Fill Rail [2]	0.437	6.233	1.010	0.003	0.016	0.047	0.063	0.006	0.042	0.048	1,428
2017 Construction [3]											
At-Grade Rail	17.942	234.920	43.900	0.078	0.392	1.890	2.282	0.141	1.714	1.855	57,786
Elevated Rail	3.839	54.524	8.959	0.029	0.144	0.405	0.549	0.052	0.363	0.415	12,749
Retained Fill Rail [2]	0.322	4.575	0.752	0.002	0.012	0.034	0.046	0.004	0.030	0.035	1,070
2014 Total [4]	**29.616**	**394.435**	**71.707**	**0.146**	**0.733**	**3.131**	**3.864**	**0.264**	**2.833**	**3.098**	**95,733**
2015 Total [4]	**29.616**	**394.435**	**71.707**	**0.146**	**0.733**	**3.131**	**3.864**	**0.264**	**2.833**	**3.098**	**95,733**
2016 Total [4]	**29.616**	**394.435**	**71.707**	**0.146**	**0.733**	**3.131**	**3.864**	**0.264**	**2.833**	**3.098**	**95,733**
2017 Total [4]	**22.104**	**294.019**	**53.610**	**0.109**	**0.548**	**2.329**	**2.877**	**0.198**	**2.107**	**2.305**	**71,605**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the Alternative.
2. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
3. Laying Track activities in 2017 only occur for the first 3 quarters of the year. While the 'Schedule' tab in the Data Request presents the 3rd quarter as a truncated period, it was conservatively assumed that emissions for a 3-month Q3 would all occur within the 2 month period.
4. Results include mitigation measures, as discussed on the 'URBEMIS At-Grade Rail' and 'URBEMIS Elev. Rail' tabs.

B.1-38 Hybrid Ave 21: Construction Emissions from Laying Track

This tab provides the emissions resulting from construction of at-grade, elevated, and retained fill rail for the Hybrid Ave 21 Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs).

Fugitive Dust Emissions from Track Construction

Parameter	Value	Comments
Length of Alternative (ft)	384,161	Refer to 'Alternatives' tab
Width of Alternative (ft)	120	Refer to 'Alignment' tab of the Data Request
Total Area Disturbed (acres)	1,058	Calculated; see notes below.
Laying Track Duration (years)	3.7	Refer to 'Schedule' tab of the Data Request
Area Disturbed per Day (acre/day)	1.0	Calculated; see notes below.
PM_{10} Emission Factor (lbs/acre/day) [1, 2]	10	Appendix A, Table A-4 of the URBEMIS2007 User Guide (2007)
PM_{10} Emissions (lbs/day) [3]	10.308	Calculated; see notes below.
PM_{10} Emissions (tpy) [3]	1.443	Calculated; see notes below.
$PM_{2.5}$ Emissions (lbs/day) [3, 4]	2.144	Calculated; see notes below.
$PM_{2.5}$ Emissions (tpy) [3, 4]	0.300	Calculated; see notes below.

Notes:

Conversion Factor: 1 acre =	43,560	square feet
Working Days per Year =	280	Assumed; consistent with material hauling estimations
Conversion Factor: 1 ton =	2,000	lbs

1. Emission factor assumes watering twice daily per the programmatic measures.
2. A grading emission factor was used to conservatively represent the PM emissions from track construction activities.
3. As a conservative approach, mitigated emissions were assumed equal to unmitigated emissions.
4. Assumed $PM_{2.5}$ emissions were 20.8% of the PM_{10} emissions,
based on the construction data provided in Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

B.1-39 Retained Fill Rail: Construction Emissions from Concrete Batch Plant Operation

This tab provides the emissions resulting from making concrete to support construction of a retaining wall for the retained fill rail by Alternative. Assumptions are documented in the Data Request ('Alignment' and 'Material Hauling' tabs). The data on this tab only applies to retained fill rail built as part of the BNSF, UPRR, and Hybrid Alternatives.

Operation Schedule:	January 2014 - August 2017
Operation Duration (years):	3.7
Operational Days per Year :	280

	BNSF Ave 21	BNSF Ave 24	UPRR Ave 21	UPRR Ave 24	Hybrid Ave 24	Hybrid Ave 21
Total Volume of Concrete (cy):	973,552	973,552	729,684	737,357	721,331	721,331
Concrete Batch Plant Rate (cy/day):	948	948	711	718	703	703

Emission Factors

Process	Uncontrolled PM_{10} EF (lb/ton)	Controlled PM_{10} EF (lb/ton)
Sand Transfer	0.00099	0
Aggregate Transfer	0.0033	0
Cement supplement unloading to storage silo	1.1	0.0049
Weigh hopper loading (lb/ton of aggregate and sand)	0.0024	0
Central Mix - Mixer loading (lb/ton of cement and cement supplement)	0.134	0.0048

Reference: AP42 Chp. 11.12 Concrete Batching. Assume supplement unloading (rather than pnenuamtic) to storage silo since supplement unloading has the higer EF.

Material Compositions

Material	Composition by Weight (lb/cy)
Sand	1,428
Course aggregate	1,865
Cement Supplement	73
Cement	491
Water (gallons / yd)	20
Total Quantity Concrete Produced	4,024

Reference: BAAQMD Permit Handbook 11.5 Concrete Batch Plants

Material Quantities (tons/day)

Material	BNSF Ave 21	BNSF Ave 24	UPRR Ave 21	UPRR Ave 24	Hybrid Ave 24	Hybrid Ave 21
Sand	677	677	507	513	502	502
Aggregate	884	884	663	670	655	655
Cement Supplement	35	35	26	26	26	26
Aggregate & Sand	1,561	1,561	1,170	1,183	1,157	1,157
Cement & Cement Supplement	267	267	200	203	198	198

Material	BNSF Ave 21		BNSF Ave 24		UPRR Ave 21		UPRR Ave 24		Hybrid Ave 24		Hybrid Ave 21	
	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$
Annual Emissions (tons/year)												
Sand	0.094	0.000	0.094	0.000	0.070	0.000	0.071	0.000	0.070	0.000	0.070	0.000
Aggregate	0.409	0.000	0.409	0.000	0.306	0.000	0.309	0.000	0.303	0.000	0.303	0.000
Cement Supplement	5.330	0.024	5.330	0.024	3.995	0.018	4.037	0.018	3.949	0.018	3.949	0.018
Aggregate & Sand	0.525	0.000	0.525	0.000	0.393	0.000	0.397	0.000	0.389	0.000	0.389	0.000
Cement & Cement Supplement	5.017	0.180	5.017	0.180	3.760	0.135	3.800	0.136	3.717	0.133	3.717	0.133
Total Annual Emissions	**11.374**	**0.203**	**11.374**	**0.203**	**8.525**	**0.152**	**8.614**	**0.154**	**8.427**	**0.151**	**8.427**	**0.151**

Notes:

Assumes that onsite concrete batch plant is used to pour forms. Construction schedule assumes that multiple operations are performed at the same time. Such as pouring concrete forms for one section at the same time as installing them for another section.

Assume onsite concrete plant is only used for the retaining wall and the average amount assumes about the same use through the construction of the retained fill rail.

Emissions were estimated based on total throughput; as a result, the emissions are independent of the number of concrete batch plants that may be present during construction.

Conservatively assumed that $PM_{2.5}$ emissions are equal to PM_{10} emissions.

B.1-40 Merced Train Station: Construction Emissions

This tab provides the emissions resulting from construction of the Merced Train Station, regardless of Alternative. Assumptions are documented in the Data Request ('MercedStation' tab).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
Mass Grading											
Dust	-	-	-	-	0.531	-	0.531	0.111	-	0.111	-
Off-Road Equipment	0.109	0.502	0.852	0.000	0.000	0.042	0.042	0.000	0.038	0.038	99
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.032	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2015 Construction											
Mass Grading											
Dust	-	-	-	-	1.037	-	1.037	0.217	-	0.217	-
Off-Road Equipment	0.199	0.951	1.529	0.000	0.000	0.075	0.075	0.000	0.069	0.069	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.057	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Building											
Off-Road Equipment	0.158	0.635	0.794	0.000	0.000	0.050	0.050	0.000	0.046	0.046	107
Vendor Trips	0.120	1.188	1.350	0.004	0.015	0.053	0.068	0.005	0.048	0.053	420
Worker Trips	0.054	1.824	0.093	0.003	0.013	0.007	0.020	0.005	0.006	0.011	265
2016 Construction											
Building											
Off-Road Equipment	0.285	1.227	1.460	0.000	0.000	0.088	0.088	0.000	0.081	0.081	212
Vendor Trips	0.217	2.166	2.347	0.008	0.030	0.093	0.123	0.010	0.084	0.095	831
Worker Trips	0.097	3.293	0.165	0.005	0.025	0.015	0.040	0.009	0.012	0.021	523
2017 Construction											
Building											
Off-Road Equipment	0.258	1.198	1.353	0.000	0.000	0.078	0.078	0.000	0.072	0.072	211
Vendor Trips	0.197	1.992	2.057	0.008	0.030	0.082	0.112	0.010	0.075	0.085	828
Worker Trips	0.086	2.999	0.149	0.005	0.025	0.014	0.039	0.009	0.011	0.020	521
2018 Construction											
Building											
Off-Road Equipment	0.233	1.175	1.260	0.000	0.000	0.068	0.068	0.000	0.063	0.063	212
Vendor Trips	0.181	1.852	1.819	0.008	0.030	0.073	0.103	0.010	0.066	0.077	831
Worker Trips	0.078	2.760	0.135	0.005	0.025	0.014	0.039	0.009	0.011	0.020	523
2019 Construction											
Building											
Off-Road Equipment	0.035	0.190	0.193	0.000	0.000	0.010	0.010	0.000	0.009	0.009	35
Vendor Trips	0.027	0.283	0.265	0.001	0.005	0.011	0.016	0.002	0.010	0.011	137
Worker Trips	0.012	0.418	0.020	0.001	0.004	0.002	0.006	0.002	0.002	0.003	86
Coating											
Architectural Coating	4.987	-	-	-	-	-	-	-	-	-	-
Worker Trips	0.001	0.029	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6
2014 Total [2]	**0.110**	**0.534**	**0.853**	**0.000**	**0.531**	**0.042**	**0.573**	**0.111**	**0.038**	**0.149**	**103**
2015 Total [2]	**0.534**	**4.655**	**3.769**	**0.007**	**1.066**	**0.185**	**1.251**	**0.227**	**0.169**	**0.396**	**994**
2016 Total [2]	**0.599**	**6.686**	**3.973**	**0.013**	**0.056**	**0.195**	**0.251**	**0.019**	**0.177**	**0.197**	**1,566**
2017 Total [2]	**0.541**	**6.189**	**3.558**	**0.013**	**0.055**	**0.174**	**0.229**	**0.019**	**0.158**	**0.177**	**1,560**
2018 Total [2]	**0.492**	**5.787**	**3.214**	**0.013**	**0.056**	**0.155**	**0.211**	**0.019**	**0.141**	**0.160**	**1,566**
2019 Total [2]	**5.062**	**0.921**	**0.480**	**0.002**	**0.009**	**0.023**	**0.032**	**0.003**	**0.021**	**0.024**	**264**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.
2. Results include mass site grading, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.

B.1-40 Merced Train Station: Construction Emissions

This tab provides the emissions resulting from construction of the Merced Train Station, regardless of Alternative. Assumptions are documented in the Data Request ('MercedStation' tab).

Construction Emissions (Fugitive Dust and Coating Mitigated)

	Emissions (tpy)										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2014 Construction											
Mass Grading											
Dust	-	-	-	-	0.481	-	0.481	0.101	-	0.101	-
Off-Road Equipment	0.109	0.502	0.852	0.000	0.000	0.042	0.042	0.000	0.038	0.038	99
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.032	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2015 Construction											
Mass Grading											
Dust	-	-	-	-	0.941	-	0.941	0.197	-	0.197	-
Off-Road Equipment	0.199	0.951	1.529	0.000	0.000	0.075	0.075	0.000	0.069	0.069	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.057	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Building											
Off-Road Equipment	0.158	0.635	0.794	0.000	0.000	0.050	0.050	0.000	0.046	0.046	107
Vendor Trips	0.120	1.188	1.350	0.004	0.015	0.053	0.068	0.005	0.048	0.053	420
Worker Trips	0.054	1.824	0.093	0.003	0.013	0.007	0.020	0.005	0.006	0.011	265
2016 Construction											
Building											
Off-Road Equipment	0.285	1.227	1.460	0.000	0.000	0.088	0.088	0.000	0.081	0.081	212
Vendor Trips	0.217	2.166	2.347	0.008	0.030	0.093	0.123	0.010	0.084	0.095	831
Worker Trips	0.097	3.293	0.165	0.005	0.025	0.015	0.040	0.009	0.012	0.021	523
2017 Construction											
Building											
Off-Road Equipment	0.258	1.198	1.353	0.000	0.000	0.078	0.078	0.000	0.072	0.072	211
Vendor Trips	0.197	1.992	2.057	0.008	0.030	0.082	0.112	0.010	0.075	0.085	828
Worker Trips	0.086	2.999	0.149	0.005	0.025	0.014	0.039	0.009	0.011	0.020	521
2018 Construction											
Building											
Off-Road Equipment	0.233	1.175	1.260	0.000	0.000	0.068	0.068	0.000	0.063	0.063	212
Vendor Trips	0.181	1.852	1.819	0.008	0.030	0.073	0.103	0.010	0.066	0.077	831
Worker Trips	0.078	2.760	0.135	0.005	0.025	0.014	0.039	0.009	0.011	0.020	523
2019 Construction											
Building											
Off-Road Equipment	0.035	0.190	0.193	0.000	0.000	0.010	0.010	0.000	0.009	0.009	35
Vendor Trips	0.027	0.283	0.265	0.001	0.005	0.011	0.016	0.002	0.010	0.011	137
Worker Trips	0.012	0.418	0.020	0.001	0.004	0.002	0.006	0.002	0.002	0.003	86
Coating											
Architectural Coating	4.488	-	-	-	-	-	-	-	-	-	-
Worker Trips	0.001	0.029	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6
2014 Total [1]	**0.110**	**0.534**	**0.853**	**0.000**	**0.482**	**0.042**	**0.523**	**0.101**	**0.038**	**0.139**	**103**
2015 Total [1]	**0.534**	**4.655**	**3.769**	**0.007**	**0.970**	**0.185**	**1.155**	**0.206**	**0.169**	**0.376**	**994**
2016 Total [1]	**0.599**	**6.686**	**3.973**	**0.013**	**0.056**	**0.195**	**0.251**	**0.019**	**0.177**	**0.197**	**1,566**
2017 Total [1]	**0.541**	**6.189**	**3.558**	**0.013**	**0.055**	**0.174**	**0.229**	**0.019**	**0.158**	**0.177**	**1,560**
2018 Total [1]	**0.492**	**5.787**	**3.214**	**0.013**	**0.056**	**0.155**	**0.211**	**0.019**	**0.141**	**0.160**	**1,566**
2019 Total [1]	**4.563**	**0.921**	**0.480**	**0.002**	**0.009**	**0.023**	**0.032**	**0.003**	**0.021**	**0.024**	**264**

Notes:

1. Mitigation for fugitive dust included watering exposed surfaces 3x daily and architectural coatings were mitigated by using low-VOC architectural coatings; both mitigation measures were applied using URBEMIS2007.

B.1-40 Merced Train Station: Construction Emissions

This tab provides the emissions resulting from construction of the Merced Train Station, regardless of Alternative. Assumptions are documented in the Data Request ('MercedStation' tab).

Construction Emissions (Final Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
2014 Construction											
Mass Grading											
Dust	-	-	-	-	0.481	-	0.481	0.101	-	0.101	-
Off-Road Equipment [3]	0.040	0.502	0.095	0.000	0.000	0.004	0.004	0.000	0.004	0.004	99
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.032	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2015 Construction											
Mass Grading											
Dust	-	-	-	-	0.941	-	0.941	0.197	-	0.197	-
Off-Road Equipment [3]	0.072	0.951	0.170	0.000	0.000	0.008	0.008	0.000	0.007	0.007	194
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.057	0.003	0.000	0.000	0.000	0.001	0.000	0.000	0.000	8
Building											
Off-Road Equipment [3]	0.057	0.635	0.088	0.000	0.000	0.005	0.005	0.000	0.005	0.005	107
Vendor Trips	0.120	1.188	1.350	0.004	0.015	0.053	0.068	0.005	0.048	0.053	420
Worker Trips	0.054	1.824	0.093	0.003	0.013	0.007	0.020	0.005	0.006	0.011	265
2016 Construction											
Building											
Off-Road Equipment [3]	0.103	1.227	0.162	0.000	0.000	0.009	0.009	0.000	0.008	0.008	212
Vendor Trips	0.217	2.166	2.347	0.008	0.030	0.093	0.123	0.010	0.084	0.095	831
Worker Trips	0.097	3.293	0.165	0.005	0.025	0.015	0.040	0.009	0.012	0.021	523
2017 Construction											
Building											
Off-Road Equipment [3]	0.093	1.198	0.150	0.000	0.000	0.008	0.008	0.000	0.007	0.007	211
Vendor Trips	0.197	1.992	2.057	0.008	0.030	0.082	0.112	0.010	0.075	0.085	828
Worker Trips	0.086	2.999	0.149	0.005	0.025	0.014	0.039	0.009	0.011	0.020	521
2018 Construction											
Building											
Off-Road Equipment [3]	0.084	1.175	0.140	0.000	0.000	0.007	0.007	0.000	0.006	0.006	212
Vendor Trips	0.181	1.852	1.819	0.008	0.030	0.073	0.103	0.010	0.066	0.077	831
Worker Trips	0.078	2.760	0.135	0.005	0.025	0.014	0.039	0.009	0.011	0.020	523
2019 Construction											
Building											
Off-Road Equipment [3]	0.013	0.190	0.021	0.000	0.000	0.001	0.001	0.000	0.001	0.001	35
Vendor Trips	0.027	0.283	0.265	0.001	0.005	0.011	0.016	0.002	0.010	0.011	137
Worker Trips	0.012	0.418	0.020	0.001	0.004	0.002	0.006	0.002	0.002	0.003	86
Coating											
Architectural Coating	4.488	-	-	-	-	-	0.000	-	-	0.000	-
Worker Trips	0.001	0.029	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6
2014 Total [4, 5]	**0.041**	**0.534**	**0.096**	**0.000**	**0.482**	**0.004**	**0.486**	**0.101**	**0.004**	**0.105**	**103**
2015 Total [4, 5]	**0.306**	**4.655**	**1.703**	**0.007**	**0.970**	**0.073**	**1.043**	**0.206**	**0.066**	**0.272**	**994**
2016 Total [4, 5]	**0.417**	**6.686**	**2.674**	**0.013**	**0.056**	**0.116**	**0.172**	**0.019**	**0.104**	**0.124**	**1,566**
2017 Total [4, 5]	**0.377**	**6.189**	**2.356**	**0.013**	**0.055**	**0.104**	**0.159**	**0.019**	**0.093**	**0.112**	**1,560**
2018 Total [4, 5]	**0.344**	**5.787**	**2.094**	**0.013**	**0.056**	**0.094**	**0.150**	**0.019**	**0.084**	**0.104**	**1,566**
2019 Total [4, 5]	**4.541**	**0.921**	**0.308**	**0.002**	**0.009**	**0.014**	**0.024**	**0.003**	**0.013**	**0.016**	**264**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust and architectural coatings control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-41 Fresno Train Station: Construction Emissions

This tab provides the emissions resulting from construction of the Fresno Train Station, regardless of Alternative. Assumptions are documented in the Data Request ('MercedStation' tab).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2014 Total	0.028	0.132	0.220	0.000	-	-	0.135	-	-	0.035	27
2015 Total	0.382	2.746	2.705	0.003	-	-	1.085	-	-	0.321	584
2016 Total	0.497	4.915	3.158	0.009	-	-	0.198	-	-	0.159	1,127
2017 Total	0.449	4.570	2.843	0.009	-	-	0.180	-	-	0.143	1,122
2018 Total	0.408	4.291	2.580	0.009	-	-	0.165	-	-	0.128	1,127
2019 Total	3.494	1.364	0.781	0.003	-	-	0.050	-	-	0.038	380

Notes:

1. Emissions calculated by URS as part of the analysis for the Fresno - Bakersfield segment. Emissions include programmatic emissions reduction measures.
2. The PM_{10} and $PM_{2.5}$ emissions include dust and exhaust emissions; as a result, dust and exhaust emissions are not listed separately.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2014 Total	0.012	0.132	0.035	0.000	-	-	0.114	-	-	0.025	27
2015 Total	0.162	2.746	0.425	0.003	-	-	0.886	-	-	0.201	584
2016 Total	0.211	4.915	0.496	0.009	-	-	0.062	-	-	0.036	1,127
2017 Total	0.190	4.570	0.446	0.009	-	-	0.060	-	-	0.033	1,122
2018 Total	0.173	4.291	0.405	0.009	-	-	0.057	-	-	0.031	1,127
2019 Total	1.337	1.364	0.123	0.003	-	-	0.019	-	-	0.010	380

Notes:

1. Emissions calculated by URS as part of the analysis for the Fresno - Bakersfield segment. Emissions include mitigation for fugitive dust, off-road construction equipment exhaust, and architectural coatings.
2. The PM_{10} and $PM_{2.5}$ emissions include dust and exhaust emissions; as a result, dust and exhaust emissions are not listed separately.

B.1-42 Traction Power Supply Station: Construction Emissions

This tab provides the emissions resulting from construction of the Traction Power Supply Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.022	-	0.022	0.005	-	0.005	0
Off-Road Equipment	0.093	0.439	0.699	0.000	0.000	0.033	0.033	0.000	0.030	0.030	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.028	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
Building											
Off-Road Equipment	0.017	0.094	0.121	0.000	0.000	0.006	0.006	0.000	0.006	0.006	20
Vendor Trips	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2017 Construction											
Building											
Off-Road Equipment	0.092	0.548	0.646	0.000	0.000	0.033	0.033	0.000	0.031	0.031	116
Vendor Trips	0.001	0.014	0.014	0.000	0.000	0.001	0.001	0.000	0.001	0.001	6
Worker Trips	0.001	0.021	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2018 Construction											
Building											
Off-Road Equipment	0.050	0.316	0.339	0.000	0.000	0.017	0.017	0.000	0.015	0.015	68
Vendor Trips	0.001	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2
Coating											
Architectural Coating	0.035	-	-	-	-	-	-	-	-	-	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [2]	**0.111**	**0.567**	**0.824**	**0.000**	**0.023**	**0.039**	**0.062**	**0.005**	**0.036**	**0.041**	**123**
2017 Total per Station [2]	**0.094**	**0.583**	**0.661**	**0.000**	**0.000**	**0.034**	**0.035**	**0.000**	**0.031**	**0.032**	**126**
2018 Total per Station [2]	**0.085**	**0.335**	**0.347**	**0.000**	**0.000**	**0.017**	**0.017**	**0.000**	**0.016**	**0.016**	**73**
2016 Total [3]	**0.221**	**1.134**	**1.648**	**0.000**	**0.045**	**0.079**	**0.124**	**0.010**	**0.072**	**0.082**	**247**
2017 Total [3]	**0.189**	**1.166**	**1.322**	**0.000**	**0.001**	**0.068**	**0.069**	**0.000**	**0.063**	**0.063**	**251**
2018 Total [3]	**0.171**	**0.670**	**0.695**	**0.000**	**0.000**	**0.034**	**0.035**	**0.000**	**0.032**	**0.032**	**147**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.
2. Results include mass site grading, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.
3. The total number of Traction Power Supply Stations to be built during this project: **2**

B.1-42 Traction Power Supply Station: Construction Emissions

This tab provides the emissions resulting from construction of the Traction Power Supply Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Fugitive Dust and Coating Mitigated)

	Emissions (tpy)										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.020	-	0.020	0.004	-	0.004	0
Off-Road Equipment	0.093	0.439	0.699	0.000	0.000	0.033	0.033	0.000	0.030	0.030	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.028	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
Building											
Off-Road Equipment	0.017	0.094	0.121	0.000	0.000	0.006	0.006	0.000	0.006	0.006	20
Vendor Trips	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2017 Construction											
Building											
Off-Road Equipment	0.092	0.548	0.646	0.000	0.000	0.033	0.033	0.000	0.031	0.031	116
Vendor Trips	0.001	0.014	0.014	0.000	0.000	0.001	0.001	0.000	0.001	0.001	6
Worker Trips	0.001	0.021	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2018 Construction											
Building											
Off-Road Equipment	0.050	0.316	0.339	0.000	0.000	0.017	0.017	0.000	0.015	0.015	68
Vendor Trips	0.001	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2
Coating											
Architectural Coating	0.031	-	-	-	-	-	-	-	-	-	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [1]	**0.111**	**0.567**	**0.824**	**0.000**	**0.020**	**0.039**	**0.060**	**0.004**	**0.036**	**0.041**	**123**
2017 Total per Station [1]	**0.094**	**0.583**	**0.661**	**0.000**	**0.000**	**0.034**	**0.035**	**0.000**	**0.031**	**0.032**	**126**
2018 Total per Station [1]	**0.082**	**0.335**	**0.347**	**0.000**	**0.000**	**0.017**	**0.017**	**0.000**	**0.016**	**0.016**	**73**

Notes:

1. Mitigation for fugitive dust included watering exposed surfaces 3x daily and architectural coatings were mitigated by using low-VOC architectural coatings; both mitigation measures were applied using URBEMIS2007.

B.1-42 Traction Power Supply Station: Construction Emissions

This tab provides the emissions resulting from construction of the Traction Power Supply Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.020	-	0.020	0.004	-	0.004	0
Off-Road Equipment [3]	0.034	0.439	0.078	0.000	0.000	0.003	0.003	0.000	0.003	0.003	98
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.028	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
Building											
Off-Road Equipment [3]	0.006	0.094	0.013	0.000	0.000	0.001	0.001	0.000	0.001	0.001	20
Vendor Trips	0.000	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2017 Construction											
Building											
Off-Road Equipment [3]	0.033	0.548	0.072	0.000	0.000	0.003	0.003	0.000	0.003	0.003	116
Vendor Trips	0.001	0.014	0.014	0.000	0.000	0.001	0.001	0.000	0.001	0.001	6
Worker Trips	0.001	0.021	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2018 Construction											
Building											
Off-Road Equipment [3]	0.018	0.316	0.038	0.000	0.000	0.002	0.002	0.000	0.002	0.002	68
Vendor Trips	0.001	0.008	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2
Coating											
Architectural Coating	0.031	-	-	-	-	-	0.000	-	-	0.000	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [4, 5]	**0.041**	**0.567**	**0.095**	**0.000**	**0.020**	**0.004**	**0.025**	**0.004**	**0.004**	**0.008**	**123**
2017 Total per Station [4, 5]	**0.035**	**0.583**	**0.087**	**0.000**	**0.000**	**0.004**	**0.004**	**0.000**	**0.004**	**0.004**	**126**
2018 Total per Station [4, 5]	**0.050**	**0.335**	**0.046**	**0.000**	**0.000**	**0.002**	**0.002**	**0.000**	**0.002**	**0.002**	**73**
2016 Total [6]	**0.082**	**1.134**	**0.191**	**0.000**	**0.041**	**0.008**	**0.049**	**0.009**	**0.008**	**0.016**	**247**
2017 Total [6]	**0.071**	**1.166**	**0.174**	**0.000**	**0.001**	**0.008**	**0.009**	**0.000**	**0.007**	**0.008**	**251**
2018 Total [6]	**0.101**	**0.670**	**0.091**	**0.000**	**0.000**	**0.004**	**0.005**	**0.000**	**0.004**	**0.004**	**147**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust and architectural coatings control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.
6. The total number of Traction Power Supply Stations to be built during this project: **2**

B.1-43 Switching Station: Construction Emissions

This tab provides the emissions resulting from construction of the Switching Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.010	-	0.010	0.002	-	0.002	0
Off-Road Equipment	0.139	0.661	1.052	0.000	0.000	0.049	0.049	0.000	0.045	0.045	147
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.042	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2017 Construction											
Building											
Off-Road Equipment	0.092	0.548	0.646	0.000	0.000	0.033	0.033	0.000	0.031	0.031	116
Vendor Trips	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2018 Construction											
Building											
Off-Road Equipment	0.036	0.227	0.243	0.000	0.000	0.012	0.012	0.000	0.011	0.011	49
Vendor Trips	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Coating											
Architectural Coating	0.005	-	-	-	-	-	-	-	-	-	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [2]	**0.141**	**0.703**	**1.054**	**0.000**	**0.010**	**0.050**	**0.060**	**0.002**	**0.046**	**0.048**	**154**
2017 Total per Station [2]	**0.093**	**0.553**	**0.648**	**0.000**	**0.000**	**0.034**	**0.034**	**0.000**	**0.031**	**0.031**	**117**
2018 Total per Station [2]	**0.040**	**0.229**	**0.244**	**0.000**	**0.000**	**0.012**	**0.012**	**0.000**	**0.011**	**0.011**	**49**
2016 Total [3]	**0.422**	**2.110**	**3.163**	**0.000**	**0.031**	**0.149**	**0.179**	**0.007**	**0.137**	**0.143**	**461.740**
2017 Total [3]	**0.278**	**1.658**	**1.944**	**0.000**	**0.000**	**0.101**	**0.101**	**0.000**	**0.093**	**0.093**	**352.333**
2018 Total [3]	**0.121**	**0.686**	**0.733**	**0.000**	**0.000**	**0.036**	**0.036**	**0.000**	**0.033**	**0.033**	**147.726**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.
2. Results include mass site grading, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.
3. The total number of Switching Stations to be built during this project: **3**

B.1-43 Switching Station: Construction Emissions

This tab provides the emissions resulting from construction of the Switching Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Fugitive Dust and Coating Mitigated)

	Emissions (tpy)										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.009	-	0.009	0.002	-	0.002	0
Off-Road Equipment	0.139	0.661	1.052	0.000	0.000	0.049	0.049	0.000	0.045	0.045	147
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.042	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2017 Construction											
Building											
Off-Road Equipment	0.092	0.548	0.646	0.000	0.000	0.033	0.033	0.000	0.031	0.031	116
Vendor Trips	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2018 Construction											
Building											
Off-Road Equipment	0.036	0.227	0.243	0.000	0.000	0.012	0.012	0.000	0.011	0.011	49
Vendor Trips	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Coating											
Architectural Coating	0.004	-	-	-	-	-	-	-	-	-	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [1]	**0.141**	**0.703**	**1.054**	**0.000**	**0.009**	**0.050**	**0.059**	**0.002**	**0.046**	**0.048**	**154**
2017 Total per Station [1]	**0.093**	**0.553**	**0.648**	**0.000**	**0.000**	**0.034**	**0.034**	**0.000**	**0.031**	**0.031**	**117**
2018 Total per Station [1]	**0.040**	**0.229**	**0.244**	**0.000**	**0.000**	**0.012**	**0.012**	**0.000**	**0.011**	**0.011**	**49**

Notes:

1. Mitigation for fugitive dust included watering exposed surfaces 3x daily and architectural coatings were mitigated by using low-VOC architectural coatings; both mitigation measures were applied using URBEMIS2007.

B.1-43 Switching Station: Construction Emissions

This tab provides the emissions resulting from construction of the Switching Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Final Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.009	-	0.009	0.002	-	0.002	0
Off-Road Equipment [3]	0.051	0.661	0.117	0.000	0.000	0.005	0.005	0.000	0.005	0.005	147
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.042	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2017 Construction											
Building											
Off-Road Equipment [3]	0.033	0.548	0.072	0.000	0.000	0.003	0.003	0.000	0.003	0.003	116
Vendor Trips	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2013 Construction											
Building											
Off-Road Equipment [3]	0.013	0.227	0.027	0.000	0.000	0.001	0.001	0.000	0.001	0.001	49
Vendor Trips	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Coating											
Architectural Coating	0.004	-	-	-	-	-	0.000	-	-	0.000	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [4, 5]	**0.052**	**0.703**	**0.119**	**0.000**	**0.009**	**0.005**	**0.014**	**0.002**	**0.005**	**0.007**	**154**
2017 Total per Station [4, 5]	**0.034**	**0.553**	**0.074**	**0.000**	**0.000**	**0.003**	**0.004**	**0.000**	**0.003**	**0.003**	**117**
2018 Total per Station [4, 5]	**0.017**	**0.229**	**0.028**	**0.000**	**0.000**	**0.001**	**0.001**	**0.000**	**0.001**	**0.001**	**49**
2016 Total [6]	**0.155**	**2.110**	**0.357**	**0.000**	**0.028**	**0.016**	**0.043**	**0.006**	**0.014**	**0.020**	**462**
2017 Total [6]	**0.101**	**1.658**	**0.221**	**0.000**	**0.000**	**0.010**	**0.011**	**0.000**	**0.010**	**0.010**	**352**
2018 Total [6]	**0.052**	**0.686**	**0.083**	**0.000**	**0.000**	**0.004**	**0.004**	**0.000**	**0.003**	**0.003**	**148**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust and architectural coatings control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.
6. The total number of Switching Stations to be built during this project: **3**

B.1-44 Paralleling Station: Construction Emissions

This tab provides the emissions resulting from construction of the Paralleling Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.008	-	0.008	0.002	-	0.002	-
Off-Road Equipment	0.139	0.661	1.052	0.000	0.000	0.049	0.049	0.000	0.045	0.045	147
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.042	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2017 Construction											
Building											
Off-Road Equipment	0.092	0.548	0.646	0.000	0.000	0.033	0.033	0.000	0.031	0.031	116
Vendor Trips	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2018 Construction											
Building											
Off-Road Equipment	0.036	0.227	0.243	0.000	0.000	0.012	0.012	0.000	0.011	0.011	49
Vendor Trips	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Coating											
Architectural Coating	0.005	-	-	-	-	-	-	-	-	-	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [2]	**0.141**	**0.703**	**1.054**	**0.000**	**0.008**	**0.050**	**0.058**	**0.002**	**0.046**	**0.047**	**154**
2017 Total per Station [2]	**0.093**	**0.553**	**0.648**	**0.000**	**0.000**	**0.034**	**0.034**	**0.000**	**0.031**	**0.031**	**117**
2018 Total per Station [2]	**0.040**	**0.229**	**0.244**	**0.000**	**0.000**	**0.012**	**0.012**	**0.000**	**0.011**	**0.011**	**49**
2016 Total [3]	**0.562**	**2.813**	**4.218**	**0.000**	**0.033**	**0.198**	**0.231**	**0.007**	**0.182**	**0.189**	**616**
2017 Total [3]	**0.370**	**2.211**	**2.592**	**0.000**	**0.000**	**0.134**	**0.135**	**0.000**	**0.124**	**0.124**	**470**
2018 Total [3]	**0.162**	**0.914**	**0.977**	**0.000**	**0.000**	**0.048**	**0.049**	**0.000**	**0.045**	**0.045**	**197**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.
2. Results include mass site grading, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.
3. The total number of Paralleling Stations to be built during this project: **4**

B.1-44 Paralleling Station: Construction Emissions

This tab provides the emissions resulting from construction of the Paralleling Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Fugitive Dust and Coating Mitigated)

	Emissions (tpy)										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.007	-	0.007	0.001	-	0.001	-
Off-Road Equipment	0.139	0.661	1.052	0.000	0.000	0.049	0.049	0.000	0.045	0.045	147
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.042	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2017 Construction											
Building											
Off-Road Equipment	0.092	0.548	0.646	0.000	0.000	0.033	0.033	0.000	0.031	0.031	116
Vendor Trips	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2018 Construction											
Building											
Off-Road Equipment	0.036	0.227	0.243	0.000	0.000	0.012	0.012	0.000	0.011	0.011	49
Vendor Trips	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Coating											
Architectural Coating	0.004	-	-	-	-	-	-	-	-	-	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [1]	**0.141**	**0.703**	**1.054**	**0.000**	**0.007**	**0.050**	**0.057**	**0.002**	**0.046**	**0.047**	**154**
2017 Total per Station [1]	**0.093**	**0.553**	**0.648**	**0.000**	**0.000**	**0.034**	**0.034**	**0.000**	**0.031**	**0.031**	**117**
2018 Total per Station [1]	**0.040**	**0.229**	**0.244**	**0.000**	**0.000**	**0.012**	**0.012**	**0.000**	**0.011**	**0.011**	**49**

Notes:

1. Mitigation for fugitive dust included watering exposed surfaces 3x daily and architectural coatings were mitigated by using low-VOC architectural coatings; both mitigation measures were applied using URBEMIS2007.

B.1-44 Paralleling Station: Construction Emissions

This tab provides the emissions resulting from construction of the Paralleling Station, regardless of Alternative. Assumptions are documented in the Data Request ('Power Stations' tab).

Construction Emissions (Final Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
2016 Construction											
Mass Grading											
Dust	-	-	-	-	0.007	-	0.007	0.001	-	0.001	-
Off-Road Equipment [3]	0.051	0.661	0.117	0.000	0.000	0.005	0.005	0.000	0.005	0.005	147
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.042	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	7
2017 Construction											
Building											
Off-Road Equipment [3]	0.033	0.548	0.072	0.000	0.000	0.003	0.003	0.000	0.003	0.003	116
Vendor Trips	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
2018 Construction											
Building											
Off-Road Equipment [3]	0.013	0.227	0.027	0.000	0.000	0.001	0.001	0.000	0.001	0.001	49
Vendor Trips	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Coating											
Architectural Coating	0.004	-	-	-	-	-	0.000	-	-	0.000	-
Worker Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
2016 Total per Station [4, 5]	**0.052**	**0.703**	**0.119**	**0.000**	**0.007**	**0.005**	**0.013**	**0.002**	**0.005**	**0.006**	**154**
2017 Total per Station [4, 5]	**0.034**	**0.553**	**0.074**	**0.000**	**0.000**	**0.003**	**0.004**	**0.000**	**0.003**	**0.003**	**117**
2018 Total per Station [4, 5]	**0.017**	**0.229**	**0.028**	**0.000**	**0.000**	**0.001**	**0.001**	**0.000**	**0.001**	**0.001**	**49**
2016 Total [6]	**0.207**	**2.813**	**0.476**	**0.000**	**0.030**	**0.021**	**0.051**	**0.006**	**0.019**	**0.025**	**616**
2017 Total [6]	**0.135**	**2.211**	**0.295**	**0.000**	**0.000**	**0.014**	**0.014**	**0.000**	**0.013**	**0.013**	**470**
2018 Total [6]	**0.069**	**0.914**	**0.111**	**0.000**	**0.000**	**0.005**	**0.005**	**0.000**	**0.005**	**0.005**	**197**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust and architectural coatings control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.
6. The total number of Paralleling Stations to be built during this project: **4**

B.1-45 Demobilization: Construction Emissions

This tab provides the emissions resulting from demobilization, regardless of Alternative. Assumptions are documented in the Data Request ('Demobilization' tab).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2017 Construction											
Mass Grading											
Dust	-	-	-	-	0.000	-	0.000	0.000	-	0.000	-
Off-Road Equipment	20.567	55.002	167.021	0.000	0.000	6.778	6.778	0.000	6.507	6.507	19,014
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.044	1.527	0.076	0.003	0.013	0.007	0.020	0.005	0.006	0.010	265
2018 Construction											
Mass Grading											
Dust	-	-	-	-	0.000	-	0.000	0.000	-	0.000	-
Off-Road Equipment	52.598	135.099	407.120	0.000	0.000	16.955	16.955	0.000	16.305	16.305	45,529
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.095	3.352	0.164	0.006	0.031	0.017	0.048	0.011	0.014	0.025	636
2019 Construction											
Mass Grading											
Dust	-	-	-	-	0.000	-	0.000	0.000	-	0.000	-
Off-Road Equipment	55.948	138.498	414.307	0.000	0.000	17.679	17.679	0.000	17.029	17.029	45,529
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.086	3.082	0.149	0.006	0.031	0.017	0.048	0.011	0.014	0.025	636
2017 Total [2]	**20.611**	**56.529**	**167.097**	**0.003**	**0.013**	**6.785**	**6.798**	**0.005**	**6.512**	**6.517**	**19,279**
2018 Total [2]	**52.693**	**138.452**	**407.284**	**0.006**	**0.031**	**16.971**	**17.002**	**0.011**	**16.318**	**16.330**	**46,164**
2019 Total [2]	**56.034**	**141.580**	**414.456**	**0.006**	**0.031**	**17.696**	**17.727**	**0.011**	**17.043**	**17.054**	**46,164**

Notes:

1. Emissions calculated in URBEMIS2007 using a custom land use category similar to an Industrial Park and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.
2. Results include mass site grading; fugitive dust emissions were assumed minimal. Worker trips are also included using the default settings of URBEMIS2007.

Construction Emissions (Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
2017 Construction											
Mass Grading											
Dust	-	-	-	-	0.000	-	0.000	0.000	-	0.000	-
Off-Road Equipment [3]	7.454	55.002	18.537	0.000	0.000	0.687	0.687	0.000	0.660	0.660	19,014
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.044	1.527	0.076	0.003	0.013	0.007	0.020	0.005	0.006	0.010	265
2018 Construction											
Mass Grading											
Dust	-	-	-	-	0.000	-	0.000	0.000	-	0.000	-
Off-Road Equipment [3]	19.064	135.099	45.185	0.000	0.000	1.719	1.719	0.000	1.653	1.653	45,529
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.095	3.352	0.164	0.006	0.031	0.017	0.048	0.011	0.014	0.025	636
2019 Construction											
Mass Grading											
Dust	-	-	-	-	0.000	-	0.000	0.000	-	0.000	-
Off-Road Equipment [3]	20.278	138.498	45.983	0.000	0.000	1.792	1.792	0.000	1.726	1.726	45,529
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.086	3.082	0.149	0.006	0.031	0.017	0.048	0.011	0.014	0.025	636
2017 Total [4, 5]	**7.498**	**56.529**	**18.613**	**0.003**	**0.013**	**0.694**	**0.707**	**0.005**	**0.665**	**0.670**	**19,279.250**
2018 Total [4, 5]	**19.159**	**138.452**	**45.349**	**0.006**	**0.031**	**1.736**	**1.767**	**0.011**	**1.667**	**1.678**	**46,164.128**
2019 Total [4, 5]	**20.364**	**141.580**	**46.132**	**0.006**	**0.031**	**1.809**	**1.840**	**0.011**	**1.740**	**1.751**	**46,164.151**

Notes:

1. Emissions calculated in URBEMIS2007 using a custom land use category similar to an Industrial Park.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes using off-road construction equipment that meets Tier 4 standards.

B.1-46 Heavy Maintenance Facility: Phase 1 Construction Emissions

This tab provides the emissions resulting from grading of the entire Heavy Maintenance Facility area. Assumptions are documented in the Data Request ('Maintenance' tab).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2017 Construction											
Mass Grading											
Dust	-	-	-	-	5.101	-	5.101	1.065	-	1.065	-
Off-Road Equipment	0.330	1.516	2.477	0.000	0.000	0.109	0.109	0.000	0.100	0.100	389
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.065	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	11
2017 Total [2]	**0.332**	**1.580**	**2.480**	**0.000**	**5.101**	**0.109**	**5.210**	**1.065**	**0.100**	**1.166**	**400**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Heavy Industry land use category and include programmatic emissions reduction measures. The programmatic reduction emission measures are called "mitigation" in the URBEMIS2007 output.
2. Results include mass site grading. Worker trips are also included using the default settings of URBEMIS2007.

Construction Emissions (Fugitive Dust and Coating Mitigated)

Construction Phase	Emissions (tpy)										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2017 Construction											
Mass Grading											
Dust	-	-	-	-	4.628	-	4.628	0.967	-	0.967	-
Off-Road Equipment	0.330	1.516	2.477	0.000	0.000	0.109	0.109	0.000	0.100	0.100	389
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.065	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	11
2017 Total [1]	**0.332**	**1.580**	**2.480**	**0.000**	**4.629**	**0.109**	**4.737**	**0.967**	**0.100**	**1.067**	**400**

Notes:

1. Mitigation for fugitive dust included watering exposed surfaces 3x daily; the mitigation measure was applied using URBEMIS2007.

Construction Emissions (Final Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2017 Construction											
Mass Grading											
Dust	-	-	-	-	4.628	-	4.628	0.967	-	0.967	-
Off-Road Equipment [3]	0.120	1.516	0.275	0.000	0.000	0.011	0.011	0.000	0.010	0.010	389
On-Road Equipment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.065	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	11
2017 Total [4, 5]	**0.122**	**1.580**	**0.278**	**0.000**	**4.629**	**0.011**	**4.640**	**0.967**	**0.010**	**0.977**	**400**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Heavy Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include mass site grading. Worker trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes fugitive dust control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-47 HMF URBEMIS2007 Elevated Structures: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of elevated structures that will be scaled on the HMF Phase II and Phase III tabs. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to structures built as part of the HMF.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy/1,000 ft) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
HMF Phase II - 2018 Construction											
Quarter 1											
Off-Road Equipment	0.220	1.076	1.626	0.000	0.000	0.072	0.072	0.000	0.066	0.066	331
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.177	0.009	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 2											
Off-Road Equipment	0.051	0.232	0.358	0.000	0.000	0.015	0.015	0.000	0.014	0.014	76
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.180	0.009	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q1 [2]	**0.225**	**1.253**	**1.635**	**0.000**	**0.002**	**0.073**	**0.074**	**0.001**	**0.067**	**0.067**	**365**
Total Q2 [2]	**0.056**	**0.412**	**0.367**	**0.000**	**0.002**	**0.016**	**0.017**	**0.001**	**0.014**	**0.015**	**110**
HMF Phase III - 2021 Construction											
Quarter 1											
Off-Road Equipment	0.194	1.040	1.340	0.000	0.000	0.057	0.057	0.000	0.052	0.052	331
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.103	0.005	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 2											
Off-Road Equipment	0.044	0.223	0.284	0.000	0.000	0.011	0.011	0.000	0.010	0.010	74
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.103	0.005	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q1 [2]	**0.196**	**1.143**	**1.345**	**0.000**	**0.002**	**0.058**	**0.059**	**0.001**	**0.053**	**0.054**	**365**
Total Q2 [2]	**0.046**	**0.326**	**0.289**	**0.000**	**0.002**	**0.012**	**0.014**	**0.001**	**0.011**	**0.012**	**108**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. Results include repeating Quarters 1 and 2 (construction of elevated structures). Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while structures are built. The Quarters represent the usage of equipment groups over a 3-month period.

B.1-47 HMF URBEMIS2007 Elevated Structures: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of elevated structures that will be scaled on the HMF Phase II and Phase III tabs. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to structures built as part of the HMF.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy/1,000 ft) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
HMF Phase II - 2018 Construction											
Quarter 1											
Off-Road Equipment [3]	0.080	1.076	0.181	0.000	0.000	0.007	0.007	0.000	0.007	0.007	331
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.177	0.009	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 2											
Off-Road Equipment [3]	0.018	0.232	0.040	0.000	0.000	0.002	0.002	0.000	0.001	0.001	76
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.180	0.009	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q1 [4, 5]	**0.085**	**1.253**	**0.189**	**0.000**	**0.002**	**0.008**	**0.010**	**0.001**	**0.007**	**0.008**	**365**
Total Q2 [4, 5]	**0.023**	**0.412**	**0.049**	**0.000**	**0.002**	**0.002**	**0.004**	**0.001**	**0.002**	**0.003**	**110**
HMF Phase III - 2021 Construction											
Quarter 1											
Off-Road Equipment [3]	0.070	1.040	0.149	0.000	0.000	0.006	0.006	0.000	0.005	0.005	331
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.103	0.005	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 2											
Off-Road Equipment [3]	0.016	0.223	0.032	0.000	0.000	0.001	0.001	0.000	0.001	0.001	74
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.103	0.005	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q1 [4, 5]	**0.073**	**1.143**	**0.153**	**0.000**	**0.002**	**0.007**	**0.008**	**0.001**	**0.006**	**0.007**	**365**
Total Q2 [4, 5]	**0.018**	**0.326**	**0.036**	**0.000**	**0.002**	**0.002**	**0.004**	**0.001**	**0.002**	**0.002**	**108**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include repeating Quarters 1 and 2 (construction of elevated structures). Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while structures are built. The Quarters represent the usage of equipment groups over a 3-month period.
5. Mitigation applied included using off-road construction equipment that meets Tier 4 standards.

B.1-48 HMF URBEMIS2007 At-Grade Rail: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of at-grade rail that will be scaled on the HMF Phase II and Phase III tabs. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to track built as part of the HMF.

Construction Emissions (Programmatic)

	Emissions (tpy/1,000 ft) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
HMF Phase II - 2018 Construction											
Quarter 1											
Off-Road Equipment	0.074	0.340	0.529	0.000	0.000	0.023	0.023	0.000	0.021	0.021	106
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.090	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Quarter 2											
Off-Road Equipment	0.072	0.328	0.515	0.000	0.000	0.022	0.022	0.000	0.020	0.020	104
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.087	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Quarter 3											
Off-Road Equipment	0.077	0.348	0.547	0.000	0.000	0.024	0.024	0.000	0.022	0.022	111
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.093	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	18
Quarter 4											
Off-Road Equipment	0.071	0.323	0.505	0.000	0.000	0.022	0.022	0.000	0.020	0.020	102
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.087	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Total Q1 [2]	**0.077**	**0.430**	**0.533**	**0.000**	**0.001**	**0.023**	**0.024**	**0.000**	**0.022**	**0.022**	**123**
Total Q2 [2]	**0.075**	**0.415**	**0.519**	**0.000**	**0.001**	**0.023**	**0.023**	**0.000**	**0.021**	**0.021**	**121**
Total Q3 [2]	**0.080**	**0.441**	**0.552**	**0.000**	**0.001**	**0.024**	**0.025**	**0.000**	**0.022**	**0.022**	**128**
Total Q4 [2]	**0.074**	**0.410**	**0.509**	**0.000**	**0.001**	**0.022**	**0.023**	**0.000**	**0.020**	**0.021**	**119**
HMF Phase III - 2021 Construction											
Quarter 1											
Off-Road Equipment	0.062	0.312	0.404	0.000	0.000	0.017	0.017	0.000	0.016	0.016	100
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.049	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.001	16
Quarter 2											
Off-Road Equipment	0.068	0.339	0.445	0.000	0.000	0.018	0.018	0.000	0.017	0.017	111
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.054	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.001	18
Quarter 3											
Off-Road Equipment	0.064	0.319	0.419	0.000	0.000	0.017	0.017	0.000	0.016	0.016	104
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.051	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Quarter 4											
Off-Road Equipment	0.065	0.324	0.423	0.000	0.000	0.018	0.018	0.000	0.016	0.016	105
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.052	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Total Q1 [2]	**0.063**	**0.361**	**0.406**	**0.000**	**0.001**	**0.017**	**0.018**	**0.000**	**0.016**	**0.016**	**116**
Total Q2 [2]	**0.069**	**0.393**	**0.447**	**0.000**	**0.001**	**0.019**	**0.020**	**0.000**	**0.017**	**0.018**	**128**
Total Q3 [2]	**0.065**	**0.370**	**0.421**	**0.000**	**0.001**	**0.018**	**0.019**	**0.000**	**0.016**	**0.017**	**121**
Total Q4 [2]	**0.066**	**0.377**	**0.426**	**0.000**	**0.001**	**0.018**	**0.019**	**0.000**	**0.017**	**0.017**	**122**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. Results include Quarters 1 through 4, which assume ballast and rail are laid simultaneously. Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while the track is laid. The Quarters represent the usage of equipment groups over a 3-month period.

B.1-48 HMF URBEMIS2007 At-Grade Rail: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of at-grade rail that will be scaled on the HMF Phase II and Phase III tabs. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to track built as part of the HMF.

Construction Emissions (Mitigated)

	Emissions (tpy/1,000 ft) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
HMF Phase II - 2018 Construction											
Quarter 1											
Off-Road Equipment [3]	0.027	0.340	0.059	0.000	0.000	0.002	0.002	0.000	0.002	0.002	106
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.090	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Quarter 2											
Off-Road Equipment [3]	0.026	0.328	0.057	0.000	0.000	0.002	0.002	0.000	0.002	0.002	104
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.087	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Quarter 3											
Off-Road Equipment [3]	0.028	0.348	0.061	0.000	0.000	0.002	0.002	0.000	0.002	0.002	111
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.003	0.093	0.005	0.000	0.001	0.000	0.001	0.000	0.000	0.001	18
Quarter 4											
Off-Road Equipment [3]	0.026	0.323	0.056	0.000	0.000	0.002	0.002	0.000	0.002	0.002	102
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.087	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Total Q1 [4, 5]	**0.029**	**0.430**	**0.063**	**0.000**	**0.001**	**0.003**	**0.004**	**0.000**	**0.003**	**0.003**	**123**
Total Q2 [4, 5]	**0.029**	**0.415**	**0.061**	**0.000**	**0.001**	**0.003**	**0.003**	**0.000**	**0.002**	**0.003**	**121**
Total Q3 [4, 5]	**0.031**	**0.441**	**0.065**	**0.000**	**0.001**	**0.003**	**0.004**	**0.000**	**0.003**	**0.003**	**128**
Total Q4 [4, 5]	**0.028**	**0.410**	**0.060**	**0.000**	**0.001**	**0.003**	**0.003**	**0.000**	**0.002**	**0.003**	**119**
HMF Phase III - 2021 Construction											
Quarter 1											
Off-Road Equipment [3]	0.022	0.312	0.045	0.000	0.000	0.002	0.002	0.000	0.002	0.002	100
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.049	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.001	16
Quarter 2											
Off-Road Equipment [3]	0.025	0.339	0.049	0.000	0.000	0.002	0.002	0.000	0.002	0.002	111
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.054	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.001	18
Quarter 3											
Off-Road Equipment [3]	0.023	0.319	0.046	0.000	0.000	0.002	0.002	0.000	0.002	0.002	104
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.051	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Quarter 4											
Off-Road Equipment [3]	0.023	0.324	0.047	0.000	0.000	0.002	0.002	0.000	0.002	0.002	105
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.052	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.001	17
Total Q1 [4, 5]	**0.023**	**0.361**	**0.047**	**0.000**	**0.001**	**0.002**	**0.003**	**0.000**	**0.002**	**0.002**	**116**
Total Q2 [4, 5]	**0.026**	**0.393**	**0.052**	**0.000**	**0.001**	**0.002**	**0.003**	**0.000**	**0.002**	**0.002**	**128**
Total Q3 [4, 5]	**0.024**	**0.370**	**0.049**	**0.000**	**0.001**	**0.002**	**0.003**	**0.000**	**0.002**	**0.002**	**121**
Total Q4 [4, 5]	**0.025**	**0.377**	**0.049**	**0.000**	**0.001**	**0.002**	**0.003**	**0.000**	**0.002**	**0.002**	**122**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include Quarters 1 through 4, which assume ballast and rail are laid simultaneously. Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while the track is laid. The Quarters represent the usage of equipment groups over a 3-month period.
5. Mitigation applied included using off-road construction equipment that meets Tier 4 standards.

B.1-49 HMF URBEMIS2007 Elevated Rail: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of elevated rail that will be scaled on the HMF Phase II and Phase III tabs. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to track built as part of the HMF.

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy/1,000 ft) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
HMF Phase II - 2018 Construction											
Quarter 3											
Off-Road Equipment	0.074	0.312	0.523	0.000	0.000	0.020	0.020	0.000	0.019	0.019	112
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.177	0.009	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 4											
Off-Road Equipment	0.080	0.390	0.555	0.000	0.000	0.026	0.026	0.000	0.024	0.024	112
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.180	0.009	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q3 [2]	**0.079**	**0.489**	**0.531**	**0.000**	**0.002**	**0.021**	**0.023**	**0.001**	**0.019**	**0.020**	**146**
Total Q4 [2]	**0.086**	**0.570**	**0.564**	**0.000**	**0.002**	**0.027**	**0.028**	**0.001**	**0.024**	**0.025**	**146**
HMF Phase III - 2021 Construction											
Quarter 3											
Off-Road Equipment	0.065	0.305	0.419	0.000	0.000	0.015	0.015	0.000	0.014	0.014	112
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.103	0.005	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 4											
Off-Road Equipment	0.069	0.379	0.447	0.000	0.000	0.020	0.020	0.000	0.018	0.018	110
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.103	0.005	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q3 [2]	**0.068**	**0.408**	**0.424**	**0.000**	**0.002**	**0.016**	**0.018**	**0.001**	**0.015**	**0.016**	**146**
Total Q4 [2]	**0.071**	**0.482**	**0.451**	**0.000**	**0.002**	**0.020**	**0.022**	**0.001**	**0.019**	**0.019**	**144**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.

2. Results include repeating Quarters 3 and 4 (laying rail). Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while the track is laid. The Quarters represent the usage of equipment groups over a 3-month period.

B.1-49 HMF URBEMIS2007 Elevated Rail: Construction Emissions per 1,000 Linear Feet

This tab provides data for the construction of elevated rail that will be scaled on the HMF Phase II and Phase III tabs. Assumptions are documented in the Data Request ('Alignment' and 'Rail Equipment' tabs). The data on this tab only applies to track built as part of the HMF.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy/1,000 ft) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
HMF Phase II - 2018 Construction											
Quarter 3											
Off-Road Equipment [3]	0.027	0.312	0.058	0.000	0.000	0.002	0.002	0.000	0.002	0.002	112
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.177	0.009	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 4											
Off-Road Equipment [3]	0.029	0.390	0.062	0.000	0.000	0.003	0.003	0.000	0.002	0.002	112
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.005	0.180	0.009	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q3 [4, 5]	**0.032**	**0.489**	**0.067**	**0.000**	**0.002**	**0.003**	**0.005**	**0.001**	**0.003**	**0.003**	**146**
Total Q4 [4, 5]	**0.034**	**0.570**	**0.070**	**0.000**	**0.002**	**0.004**	**0.005**	**0.001**	**0.003**	**0.004**	**146**
HMF Phase III - 2021 Construction											
Quarter 3											
Off-Road Equipment [3]	0.024	0.305	0.047	0.000	0.000	0.002	0.002	0.000	0.001	0.001	112
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.103	0.005	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Quarter 4											
Off-Road Equipment [3]	0.025	0.379	0.050	0.000	0.000	0.002	0.002	0.000	0.002	0.002	110
Vendor Trips	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.002	0.103	0.005	0.000	0.002	0.001	0.003	0.001	0.001	0.001	34
Total Q3 [4, 5]	**0.026**	**0.408**	**0.051**	**0.000**	**0.002**	**0.002**	**0.004**	**0.001**	**0.002**	**0.003**	**146**
Total Q4 [4, 5]	**0.027**	**0.482**	**0.054**	**0.000**	**0.002**	**0.003**	**0.005**	**0.001**	**0.003**	**0.003**	**144**

Notes:

1. Construction emissions were estimated using URBEMIS2007, assuming the equipment numbers and types input to the model represented constructing 1,000 linear feet of alignment.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include repeating Quarters 3 and 4 (laying rail). Worker trips are also included using the default settings of URBEMIS2007. Assumed no vendor trips while track is laid. The Quarters represent the usage of equipment groups over a 3-month period.
5. Mitigation applied included using off-road construction equipment that meets Tier 4 standards.

B.1-50 Heavy Maintenance Facility: Phase II Construction Emissions from Building Activities

This tab provides the emissions resulting from paving and building construction activities for the Overnight Layover / Servicing Facility (LMF). Assumptions are documented in the Data Request ('Maintenance' tab).

Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2018 Construction											
Asphalt											
Off-Gas	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.017	0.091	0.104	0.000	0.000	0.008	0.008	0.000	0.007	0.007	13
On-Road Equipment	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2
Building											
Off-Road Equipment	0.043	0.272	0.293	0.000	0.000	0.015	0.015	0.000	0.013	0.013	59
Vendor Trips	0.001	0.015	0.014	0.000	0.000	0.001	0.001	0.000	0.001	0.001	7
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2018 Total [2]	**0.064**	**0.411**	**0.415**	**0.000**	**0.001**	**0.023**	**0.024**	**0.000**	**0.021**	**0.021**	**85**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Heavy Industry land use category. The programmatic emissions reduction measures were not applicable to the modeled construction phases.
2. Results include paving and building construction. Worker and vendor trips are also included using the default settings of URBEMIS2007.

Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10} [2]	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ [2]	CO_2
2018 Construction											
Asphalt											
Off-Gas	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment [3]	0.006	0.091	0.012	0.000	0.000	0.001	0.001	0.000	0.001	0.001	13
On-Road Equipment	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Worker Trips	0.000	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2
Building											
Off-Road Equipment [3]	0.015	0.272	0.032	0.000	0.000	0.001	0.001	0.000	0.001	0.001	59
Vendor Trips	0.001	0.015	0.014	0.000	0.000	0.001	0.001	0.000	0.001	0.001	7
Worker Trips	0.001	0.022	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4
2018 Total [4, 5]	**0.026**	**0.411**	**0.062**	**0.000**	**0.001**	**0.003**	**0.004**	**0.000**	**0.003**	**0.003**	**85**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Heavy Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include paving and building construction. Worker and vendor trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes using off-road construction equipment that meets Tier 4 standards.

B.1-51 Heavy Maintenance Facility: Phase II Construction Emissions from Laying Track

This tab provides the emissions resulting from lying elevated, at-grade, and retained fill rail and constructing elevated structures located at the LMF. Assumptions are documented in the Data Request ('Maintenance' and 'Alignment' tabs).

Track Construction Emissions (Programmatic)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2018 Construction											
Elevated Structures	0.086	0.510	0.613	0.000	0.001	0.027	0.028	0.000	0.025	0.025	145
At-Grade Rail [2]	0.218	1.212	1.510	0.000	0.002	0.066	0.068	0.001	0.061	0.061	351
Elevated Rail	0.050	0.324	0.335	0.000	0.001	0.015	0.016	0.000	0.013	0.014	89
Retained Fill Rail [3]	0.022	0.142	0.147	0.000	0.000	0.006	0.007	0.000	0.006	0.006	39
2018 Total	**0.376**	**2.188**	**2.606**	**0.001**	**0.005**	**0.114**	**0.119**	**0.002**	**0.105**	**0.106**	**624**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the LMF Track.

2. Laying At-Grade Rail only occurs over a 6 month period but conservatively includes the emissions from an entire year's worth of activities to ensure a full cycle of construction has occurred.
3. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.

Track Construction Emissions (Mitigated)

Construction Phase	Emissions (tpy) [1]										
	ROG	CO	NOx	SOx	PM_{10} Dust	PM_{10} Exhaust	PM_{10}	$PM_{2.5}$ Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$	CO_2
2018 Construction											
Elevated Structures	0.033	0.510	0.073	0.000	0.001	0.003	0.004	0.000	0.003	0.003	145
At-Grade Rail [2]	0.084	1.212	0.179	0.000	0.002	0.008	0.010	0.001	0.007	0.008	351
Elevated Rail	0.020	0.324	0.042	0.000	0.001	0.002	0.003	0.000	0.002	0.002	89
Retained Fill Rail [3]	0.009	0.142	0.018	0.000	0.000	0.001	0.001	0.000	0.001	0.001	39
2018 Total [4]	**0.146**	**2.188**	**0.312**	**0.001**	**0.005**	**0.014**	**0.019**	**0.002**	**0.013**	**0.014**	**624**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the LMF Track.

2. Laying At-Grade Rail only occurs over a 6 month period but conservatively includes the emissions from an entire year's worth of activities to ensure a full cycle of construction has occurred.
3. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
4. Results include mitigation measures, as discussed on the 'HMF URBEMIS At-Grade Rail', 'HMF URBEMIS Elev. Rail', and 'HMF URBEMIS Elev. Str.' tabs.

Fugitive Dust Emissions from Track Construction

Parameter	Value	Comments
Length of Alternative (ft)	385	Refer to 'Alternatives' tab
Width of Alternative (ft)	120	Refer to 'Alignment' tab of the Data Request
Total Area Disturbed (acres)	1	Calculated; see notes below.
Laying Track Duration (years)	0.5	Refer to 'Schedule' tab of the Data Request
Area Disturbed per Day (acre/day)	0.008	Calculated; see notes below.
PM_{10} Emission Factor (lbs/acre/day) [1, 2]	10	Appendix A, Table A-4 of the URBEMIS2007 User Guide (2007)
PM_{10} Emissions (lbs/day) [3]	0.076	Calculated; see notes below.
PM_{10} Emissions (tpy) [3]	0.011	Calculated; see notes below.
$PM_{2.5}$ Emissions (lbs/day) [3, 4]	0.016	Calculated; see notes below.
$PM_{2.5}$ Emissions (tpy) [3, 4]	0.002	Calculated; see notes below.

Notes:

Conversion Factor: 1 acre =	43,560	square feet
Working Days per Year =	280	Assumed; consistent with material hauling estimations
Conversion Factor: 1 ton =	2,000	lbs

1. Emission factor assumes watering twice daily per the programmatic measures.

2. A grading emission factor was used to conservatively represent the PM emissions from track construction activities.

3. As a conservative approach, mitigated emissions were assumed equal to unmitigated emissions. All emissions were released in 2018, during LMF Track Construction.

4. Assumed $PM_{2.5}$ emissions were 20.8% of the PM_{10} emissions,
based on the construction data provided in Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

B.1-52 Heavy Maintenance Facility: Phase III Construction Emissions from Building Activities

This tab provides the emissions resulting from paving, building construction, and architectural coating activities for the HMF. Assumptions are documented in the Data Request ('Maintenance' tab).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2021 Construction											
Asphalt											
Off-Gas	0.178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.018	0.101	0.111	0.000	0.000	0.009	0.009	0.000	0.008	0.008	15
On-Road Equipment	0.013	0.054	0.120	0.001	0.003	0.004	0.007	0.001	0.004	0.005	81
Worker Trips	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Building											
Off-Road Equipment	0.095	0.567	0.544	0.000	0.000	0.026	0.026	0.000	0.024	0.024	105
Vendor Trips	0.089	0.942	0.742	0.006	0.023	0.033	0.056	0.008	0.030	0.037	641
Worker Trips	0.030	1.237	0.056	0.004	0.020	0.011	0.031	0.007	0.009	0.016	403
Coating											
Architectural Coating	7.716	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.028	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2021 Total [2]	**8.138**	**2.934**	**1.573**	**0.011**	**0.046**	**0.083**	**0.129**	**0.016**	**0.074**	**0.090**	**1,256**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Heavy Industry land use category. The programmatic emissions reduction measures were not applicable to the modeled construction phases; the results are called "unmitigated" in the URBEMIS2007 output.
2. Results include paving, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.

Construction Emissions (Coating Mitigated)

	Emissions (tpy)										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2021 Construction											
Asphalt											
Off-Gas	0.178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment	0.018	0.101	0.111	0.000	0.000	0.009	0.009	0.000	0.008	0.008	15
On-Road Equipment	0.013	0.054	0.120	0.001	0.003	0.004	0.007	0.001	0.004	0.005	81
Worker Trips	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Building											
Off-Road Equipment	0.095	0.567	0.544	0.000	0.000	0.026	0.026	0.000	0.024	0.024	105
Vendor Trips	0.089	0.942	0.742	0.006	0.023	0.033	0.056	0.008	0.030	0.037	641
Worker Trips	0.030	1.237	0.056	0.004	0.020	0.011	0.031	0.007	0.009	0.016	403
Coating											
Architectural Coating	6.944	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.028	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2021 Total [1]	**7.367**	**2.934**	**1.573**	**0.011**	**0.046**	**0.083**	**0.129**	**0.016**	**0.074**	**0.090**	**1,256**

Notes:

1. Mitigation for architectural coatings were mitigated by using low-VOC architectural coatings; the mitigation measure was applied using URBEMIS2007; the results are called "mitigated" in the URBEMIS2007 output.

Construction Emissions (Final Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10} [2]**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ [2]**	**CO_2**
2021 Construction											
Asphalt											
Off-Gas	0.178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Off-Road Equipment [3]	0.006	0.101	0.012	0.000	0.000	0.001	0.001	0.000	0.001	0.001	15
On-Road Equipment	0.013	0.054	0.120	0.001	0.003	0.004	0.007	0.001	0.004	0.005	81
Worker Trips	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1
Building											
Off-Road Equipment [3]	0.034	0.567	0.060	0.000	0.000	0.003	0.003	0.000	0.002	0.002	105
Vendor Trips	0.089	0.942	0.742	0.006	0.023	0.033	0.056	0.008	0.030	0.037	641
Worker Trips	0.030	1.237	0.056	0.004	0.020	0.011	0.031	0.007	0.009	0.016	403
Coating											
Architectural Coating	6.944	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Worker Trips	0.001	0.028	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	9
2021 Total [4, 5]	**7.295**	**2.934**	**0.992**	**0.011**	**0.046**	**0.052**	**0.098**	**0.016**	**0.046**	**0.062**	**1,256**

Notes:

1. Emissions calculated in URBEMIS2007 using the General Heavy Industry land use category.
2. PM_{10} and $PM_{2.5}$ emissions were taken as the sum of the PM_Exhaust and PM_Dust emissions.
3. The off-road construction equipment mitigation was applied externally to the URBEMIS2007 results and was only applied for exhaust-related emissions for ROG, NOx, and PM.
4. Results include paving, building construction, and architectural coatings. Worker and vendor trips are also included using the default settings of URBEMIS2007.
5. Mitigation applied includes architectural coatings control, discussed in the previous table, and using off-road construction equipment that meets Tier 4 standards.

B.1-53 Heavy Maintenance Facility: Phase III Construction Emissions from Laying Track

This tab provides the emissions resulting from lying elevated, at-grade, and retained fill rail and constructing elevated structures located at the HMF. Assumptions are documented in the Data Request ('Maintenance' and 'Alignment' tabs).

Construction Emissions (Programmatic)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2021 Construction											
Elevated Structures	7.674	46.473	51.682	0.021	0.104	2.210	2.314	0.037	2.027	2.064	14,962
At-Grade Rail [2]	19.437	110.746	125.551	0.048	0.242	5.330	5.572	0.087	4.889	4.976	35,948
Elevated Rail	4.390	28.144	27.692	0.021	0.104	1.165	1.268	0.037	1.065	1.103	9,154
Retained Fill Rail [3]	1.924	12.337	12.139	0.009	0.045	0.511	0.556	0.016	0.467	0.483	4,012
2021 Total	**33.425**	**197.699**	**217.064**	**0.098**	**0.494**	**9.216**	**9.710**	**0.178**	**8.449**	**8.627**	**64,076**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the HMF Track.

2. Laying At-Grade Rail only occurs over a 6 month period but conservatively includes the emissions from an entire year's worth of activities to ensure a full cycle of construction has occurred.
3. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.

Construction Emissions (Mitigated)

	Emissions (tpy) [1]										
Construction Phase	**ROG**	**CO**	**NOx**	**SOx**	**PM_{10} Dust**	**PM_{10} Exhaust**	**PM_{10}**	**$PM_{2.5}$ Dust**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$**	**CO_2**
2021 Construction											
Elevated Structures	2.880	46.473	6.000	0.021	0.104	0.277	0.381	0.037	0.249	0.286	14,962
At-Grade Rail [2]	7.276	110.746	14.550	0.048	0.242	0.664	0.906	0.087	0.596	0.684	35,948
Elevated Rail	1.690	28.144	3.337	0.021	0.104	0.171	0.275	0.037	0.151	0.189	9,154
Retained Fill Rail [3]	0.741	12.337	1.463	0.009	0.045	0.075	0.120	0.016	0.066	0.083	4,012
2021 Total [4]	**12.588**	**197.699**	**25.349**	**0.098**	**0.494**	**1.188**	**1.682**	**0.178**	**1.063**	**1.241**	**64,076**

Notes:

1. Emissions were summed based on the presumed schedule, as presented on the 'Schedule' tab in the Data Request, and scaled by the material-scaled length of the HMF Track.

2. Laying At-Grade Rail only occurs over a 6 month period but conservatively includes the emissions from an entire year's worth of activities to ensure a full cycle of construction has occurred.
3. Retained Fill Rail was assumed to use the same equipment and construction schedule as the Elevated Rail.
4. Results include mitigation measures, as discussed on the 'HMF URBEMIS At-Grade Rail', 'HMF URBEMIS Elev. Rail', and 'HMF URBEMIS Elev. Str.' tabs.

Fugitive Dust Emissions from Track Construction

Parameter	Value	Comments
Length of Alternative (ft)	39,769	Refer to 'Alternatives' tab
Width of Alternative (ft)	120	Refer to 'Alignment' tab of the Data Request
Total Area Disturbed (acres)	110	Calculated; see notes below.
Laying Track Duration (years)	0.5	Refer to 'Schedule' tab of the Data Request
Area Disturbed per Day (acre/day)	0.8	Calculated; see notes below.
PM_{10} Emission Factor (lbs/acre/day) [1, 2]	10	Appendix A, Table A-4 of the URBEMIS2007 User Guide (2007)
PM_{10} Emissions (lbs/day) [3]	7.825	Calculated; see notes below.
PM_{10} Emissions (tpy) [3]	1.096	Calculated; see notes below.
$PM_{2.5}$ Emissions (lbs/day) [3, 4]	1.628	Calculated; see notes below.
$PM_{2.5}$ Emissions (tpy) [3, 4]	0.228	Calculated; see notes below.

Notes:

Conversion Factor: 1 acre =	43,560	square feet
Working Days per Year =	280	Assumed; consistent with material hauling estimations
Conversion Factor: 1 ton =	2,000	lbs

1. Emission factor assumes watering twice daily per the programmatic measures.

2. A grading emission factor was used to conservatively represent the PM emissions from track construction activities.

3. As a conservative approach, mitigated emissions were assumed equal to unmitigated emissions. All emissions were released in 2021, during HMF Track Construction.

4. Assumed $PM_{2.5}$ emissions were 20.8% of the PM_{10} emissions,
based on the construction data provided in Appendix A of the SCAQMD's *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (2006).

B.1-54 HMF Elevated Structures: Construction Emissions from Concrete Batch Plant Operation

This tab provides the emissions resulting from making concrete to support construction of elevated structures for the HMF. Assumptions are documented in the Data Request ('Alignment' and 'Material Hauling' tabs). The data on this tab only applies to structures built as part of the HMF Phase II (LMF) and Phase III (HMF) activities.

	LMF Track	HMF Track
Operation Schedule:	July 2018 - December 2018	February 2021 - July 2021
Operation Duration (years):	0.5	0.5
Operational Days per Year :	280	280

	LMF Track	HMF Track
Total Volume of Concrete (cy):	1,531	158,165
Concrete Batch Plant Rate (cy/day):	11	1,130

Emission Factors

Process	Uncontrolled PM_{10} EF (lb/ton)	Controlled PM_{10} EF (lb/ton)
Sand Transfer	0.00099	0
Aggregate Transfer	0.0033	0
Cement supplement unloading to storage silo	1.1	0.0049
Weigh hopper loading (lb/ton of aggregate and sand)	0.0024	0
Central Mix - Mixer loading (lb/ton of cement and cement supplement)	0.134	0.0048

Reference: AP42 Chp. 11.12 Concrete Batching. Assume supplement unloading (rather than pnenuamtic) to storage silo since supplement unloading has the higer EF.

Material Compositions

Material	Composition by Weight (lb/cy)
Sand	1,428
Course aggregate	1,865
Cement Supplement	73
Cement	491
Water (gallons / yd)	20
Total Quantity Concrete Produced	4,024

Reference: BAAQMD Permit Handbook 11.5 Concrete Batch Plants

Material Quantities (tons/day)

Material	LMF Track	HMF Track
Sand	8	807
Aggregate	10	1,053
Cement Supplement	0	41
Aggregate & Sand	18	1,860
Cement & Cement Supplement	3	319

Material	LMF Track (2018 Only)		HMF Track (2021 Only)	
	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$
Annual Emissions (tons/year)				
Sand	0.001	0.000	0.056	0.000
Aggregate	0.002	0.000	0.243	0.000
Cement Supplement	0.031	0.000	3.175	0.014
Aggregate & Sand	0.003	0.000	0.313	0.000
Cement & Cement Supplement	0.029	0.001	2.988	0.107
Total Annual Emissions	**0.066**	**0.001**	**6.775**	**0.121**

Notes:

Assumes that onsite concrete batch plant is used to pour forms. Construction schedule assumes that multiple operations are performed at the same time. Such as pouring concrete forms for one section at the same time as installing them for another section.

Assume onsite concrete plant is only used for the elevated structures and the average amount assumes about the same use through the construction of the elevated structures.

Emissions were estimated based on total throughput; as a result, the emissions are independent of the number of concrete batch plants that may be present during construction.

Conservatively assumed that $PM_{2.5}$ emissions are equal to PM_{10} emissions.

B.1-55 HMF Retained Fill Rail: Construction Emissions from Concrete Batch Plant Operation

This tab provides the emissions resulting from making concrete to support construction of a retaining wall for the HMF retained fill rail. Assumptions are documented in the Data Request ('Alignment' and 'Material Hauling' tabs). The data on this tab only applies to retained fill rail built as part of the HMF Phase II (LMF) and Phase III (HMF) activities.

	LMF Track	HMF Track
Operation Schedule:	July 2018 - December 2018	February 2021 - July 2021
Operation Duration (years):	0.5	0.5
Operational Days per Year :	280	280

	LMF Track	HMF Track
Total Volume of Concrete (cy):	5,368	554,632
Concrete Batch Plant Rate (cy/day):	38	3,962

Emission Factors

Process	Uncontrolled PM_{10} EF (lb/ton)	Controlled PM_{10} EF (lb/ton)
Sand Transfer	0.00099	0
Aggregate Transfer	0.0033	0
Cement supplement unloading to storage silo	1.1	0.0049
Weigh hopper loading (lb/ton of aggregate and sand)	0.0024	0
Central Mix - Mixer loading (lb/ton of cement and cement supplement)	0.134	0.0048

Reference: AP42 Chp. 11.12 Concrete Batching. Assume supplement unloading (rather than pnenuamtic) to storage silo since supplement unloading has the higer EF.

Material Compositions

Material	Composition by Weight (lb/cy)
Sand	1,428
Course aggregate	1,865
Cement Supplement	73
Cement	491
Water (gallons / yd)	20
Total Quantity Concrete Produced	4,024

Reference: BAAQMD Permit Handbook 11.5 Concrete Batch Plants

Material Quantities (tons/day)

Material	LMF Track	HMF Track
Sand	27	2,829
Aggregate	36	3,694
Cement Supplement	1	145
Aggregate & Sand	63	6,523
Cement & Cement Supplement	11	1,117

Material	LMF Track (2018 Only)		HMF Track (2021 Only)	
	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$	Uncontrolled $PM_{10}/PM_{2.5}$	Controlled $PM_{10}/PM_{2.5}$
Annual Emissions (tons/year)				
Sand	0.002	0.000	0.196	0.000
Aggregate	0.008	0.000	0.853	0.000
Cement Supplement	0.108	0.000	11.134	0.050
Aggregate & Sand	0.011	0.000	1.096	0.000
Cement & Cement Supplement	0.101	0.004	10.479	0.375
Total Annual Emissions	**0.230**	**0.004**	**23.759**	**0.425**

Notes:

Assumes that onsite concrete batch plant is used to pour forms. Construction schedule assumes that multiple operations are performed at the same time. Such as pouring concrete forms for one section at the same time as installing them for another section.

Assume onsite concrete plant is only used for the retaining wall and the average amount assumes about the same use through the construction of the retained fill rail.

Emissions were estimated based on total throughput; as a result, the emissions are independent of the number of concrete batch plants that may be present during construction.

Conservatively assumed that $PM_{2.5}$ emissions are equal to PM_{10} emissions.

B.1-56 SJVAB Material Hauling: Construction Emissions from Hauling

This tab provides the emissions resulting from hauling materials used during construction of the elevated structures, elevated rail, at-grade rail, and retained fill rail. Assumptions are documented in the Data Request ('Material Hauling' tab).

Alternative	Total Programmatic Emissions (tpy) [1, 2]								Total Mitigated Emissions (tpy) [1, 2, 3]							
	ROG	CO	NO_2	SO_2	PM_{10} - Total	$PM_{2.5}$ - Total	CO_2	CH_4 [4]	ROG	CO	NO_2	SO_2	PM_{10} - Total	$PM_{2.5}$ - Total	CO_2	CH_4 [4]
2013 Construction																
BNSF Ave 21	4.2	21.4	72.8	0.1	3.6	3.0	11,507	0.2	0.7	6.6	6.6	0.1	0.9	0.5	11,463	0.0
BNSF Ave 24	4.6	23.0	78.5	0.1	3.9	3.3	12,398	0.2	0.7	7.1	7.1	0.1	0.9	0.6	12,350	0.0
UPRR Ave 21	5.4	27.0	92.1	0.1	4.5	3.8	14,548	0.3	0.9	8.3	8.3	0.1	1.1	0.7	14,492	0.0
UPRR Ave 24	5.0	25.3	86.0	0.1	4.2	3.6	13,595	0.2	0.8	7.8	7.8	0.1	1.0	0.6	13,542	0.0
Hybrid Ave 24	2.9	14.7	50.0	0.1	2.5	2.1	7,903	0.1	0.5	4.5	4.5	0.1	0.6	0.4	7,873	0.0
Hybrid Ave 21	4.0	20.3	69.2	0.1	3.4	2.9	10,933	0.2	0.6	6.2	6.3	0.1	0.8	0.5	10,890	0.0
2014 Construction																
BNSF Ave 21	15.4	75.8	278.1	0.4	11.8	10.3	39,966	0.5	6.6	37.8	116.1	0.4	5.0	4.0	39,842	0.1
BNSF Ave 24	16.1	79.4	290.1	0.4	12.4	10.7	41,932	0.5	6.8	39.2	119.1	0.4	5.2	4.1	41,801	0.1
UPRR Ave 21	16.4	81.9	294.6	0.4	12.8	11.1	43,742	0.6	6.4	38.8	111.0	0.4	5.1	4.0	43,602	0.1
UPRR Ave 24	16.1	79.8	288.9	0.4	12.5	10.8	42,468	0.6	6.5	38.4	112.4	0.4	5.1	4.0	42,333	0.1
Hybrid Ave 24	11.4	56.2	207.8	0.3	8.7	7.6	29,417	0.4	5.1	28.6	90.6	0.3	3.8	3.1	29,327	0.1
Hybrid Ave 21	14.0	69.1	252.2	0.4	10.8	9.3	36,510	0.5	5.9	34.1	103.1	0.4	4.5	3.6	36,397	0.1
2015 Construction																
BNSF Ave 21	12.3	63.3	224.7	0.3	9.4	8.2	34,621	0.4	5.9	34.8	108.7	0.3	4.5	3.6	34,520	0.1
BNSF Ave 24	13.0	66.7	235.6	0.4	10.0	8.6	36,637	0.4	6.1	36.2	111.6	0.4	4.7	3.7	36,528	0.1
UPRR Ave 21	13.7	71.1	245.3	0.4	10.7	9.2	39,803	0.5	5.9	36.5	104.8	0.4	4.7	3.7	39,680	0.1
UPRR Ave 24	13.3	68.6	238.7	0.4	10.3	8.9	38,167	0.4	5.9	36.0	105.9	0.4	4.6	3.7	38,051	0.1
Hybrid Ave 24	9.1	46.2	166.2	0.2	6.9	6.0	24,990	0.3	4.6	26.1	84.6	0.2	3.4	2.7	24,919	0.1
Hybrid Ave 21	11.3	58.3	205.7	0.3	8.7	7.6	32,102	0.4	5.3	31.5	96.7	0.3	4.1	3.2	32,007	0.1
2016 Construction																
BNSF Ave 21	8.2	44.2	157.0	0.2	6.1	5.3	23,936	0.2	4.8	28.7	96.8	0.2	3.5	2.9	23,875	0.1
BNSF Ave 24	8.8	47.6	167.0	0.2	6.6	5.8	26,049	0.2	5.0	30.2	99.7	0.2	3.7	3.0	25,981	0.1
UPRR Ave 21	10.2	55.7	186.2	0.3	7.9	6.8	31,929	0.3	5.1	32.1	94.9	0.3	3.9	3.1	31,836	0.1
UPRR Ave 24	9.6	52.3	177.6	0.3	7.4	6.4	29,568	0.3	5.0	31.1	95.5	0.3	3.8	3.1	29,485	0.1
Hybrid Ave 24	5.8	30.8	112.4	0.2	4.2	3.7	16,139	0.1	3.7	21.1	75.0	0.2	2.5	2.2	16,101	0.0
Hybrid Ave 21	7.8	42.3	147.6	0.2	5.9	5.1	23,289	0.2	4.4	26.5	86.6	0.2	3.2	2.7	23,227	0.1
2017 Construction																
BNSF Ave 21	5.9	34.2	110.3	0.2	4.6	4.0	20,065	0.2	3.2	21.4	63.5	0.2	2.5	2.0	20,010	0.0
BNSF Ave 24	6.4	37.2	118.5	0.2	5.0	4.3	22,100	0.2	3.4	22.8	65.7	0.2	2.7	2.1	22,038	0.1
UPRR Ave 21	7.7	45.5	137.8	0.3	6.3	5.4	28,358	0.3	3.6	25.4	64.2	0.3	3.1	2.3	28,271	0.1
UPRR Ave 24	7.2	42.2	129.7	0.2	5.8	4.9	25,907	0.2	3.5	24.2	64.0	0.2	2.9	2.2	25,829	0.1
Hybrid Ave 24	4.0	23.1	77.0	0.1	3.0	2.7	13,077	0.1	2.4	15.4	48.6	0.1	1.8	1.5	13,043	0.0
Hybrid Ave 21	5.7	33.3	105.3	0.2	4.5	3.9	19,875	0.2	3.0	20.2	57.3	0.2	2.4	1.9	19,818	0.0
2018 Construction																
BNSF Ave 21	0.1	0.5	1.3	0.0	0.1	0.1	318	0.0	0.0	0.2	0.5	0.0	0.0	0.0	317	0.0
BNSF Ave 24	0.1	0.5	1.3	0.0	0.1	0.1	318	0.0	0.0	0.2	0.5	0.0	0.0	0.0	317	0.0
UPRR Ave 21	0.1	0.5	1.3	0.0	0.1	0.1	318	0.0	0.0	0.2	0.5	0.0	0.0	0.0	317	0.0
UPRR Ave 24	0.1	0.5	1.3	0.0	0.1	0.1	318	0.0	0.0	0.2	0.5	0.0	0.0	0.0	317	0.0
Hybrid Ave 24	0.1	0.5	1.3	0.0	0.1	0.1	318	0.0	0.0	0.2	0.5	0.0	0.0	0.0	317	0.0
Hybrid Ave 21	0.1	0.5	1.3	0.0	0.1	0.1	318	0.0	0.0	0.2	0.5	0.0	0.0	0.0	317	0.0
2021 Construction																
BNSF Ave 21	5.8	42.1	96.9	0.3	5.2	4.2	32,850	0.2	2.9	25.8	48.8	0.3	2.9	2.0	32,743	0.1
BNSF Ave 24	5.8	42.1	96.9	0.3	5.2	4.2	32,850	0.2	2.9	25.8	48.8	0.3	2.9	2.0	32,743	0.1
UPRR Ave 21	5.8	42.1	96.9	0.3	5.2	4.2	32,850	0.2	2.9	25.8	48.8	0.3	2.9	2.0	32,743	0.1
UPRR Ave 24	5.8	42.1	96.9	0.3	5.2	4.2	32,850	0.2	2.9	25.8	48.8	0.3	2.9	2.0	32,743	0.1
Hybrid Ave 24	5.8	42.1	96.9	0.3	5.2	4.2	32,850	0.2	2.9	25.8	48.8	0.3	2.9	2.0	32,743	0.1
Hybrid Ave 21	5.8	42.1	96.9	0.3	5.2	4.2	32,850	0.2	2.9	25.8	48.8	0.3	2.9	2.0	32,743	0.1

Notes:

1. Conversion factor - 1 short ton: 907,185 grams
2. Conversion factor - 1 gallon rail fuel: 400 ton-miles
3. Mitigated emissions assume the haul trucks meet the 2007 EPA standards and 100% NOx phase-in. This corresponds to assuming the haul trucks have the same emission rate and the model year 2010 in the EMFAC model. Mitigated emission factors for material hauling by rail were not available.
4. CH_4 emissions were not estimated for the material hauling by rail as CH_4 emission factors were not available or considered significant emissions contributors.

B.1-57 SJVAB Material Hauling by Truck: Miles Traveled

This tab provides the data that will be used on the SJVAB Material Haul Emissions tab to calculate material hauling emissions from haul trucks. Assumptions are documented in the Data Request ('Material Hauling' tab).

Vehicle-Miles Traveled Summary

Alternative	Total VMT for Material Hauling by Haul Truck						
	2013	2014	2015	2016	2017	2018 [1]	2021 [2]
BNSF Ave 21	6,332,419	17,937,362	14,997,121	9,116,639	8,339,211	156,472	16,166,764
BNSF Ave 24	6,822,416	18,937,444	16,024,250	10,197,862	9,404,723	156,472	16,166,764
UPRR Ave 21	8,005,797	20,329,776	18,163,264	13,830,238	13,113,015	156,472	16,166,764
UPRR Ave 24	7,481,093	19,534,222	17,168,221	12,436,218	11,700,873	156,472	16,166,764
Hybrid Ave 24	4,349,086	12,978,983	10,543,494	5,672,516	5,057,409	156,472	16,166,764
Hybrid Ave 21	6,016,105	16,514,445	14,089,379	9,239,247	8,553,525	156,472	16,166,764

Notes:
1. 2018 is the year in which all of the LMF Track is constructed. This will hold true for all Alternatives.
2. 2021 is the year in which all of the HMF Track is constructed. This will hold true for all Alternatives.

Vehicle-Miles Traveled Calculations

Material Type	BNSF Ave 21	BNSF Ave 24	UPRR Ave 21	UPRR Ave 24	Hybrid Ave 24	Hybrid Ave 21	LMF Track	HMF Track
Number of Miles Driven per Year 2013								
Excavation	1,933,624	1,940,235	1,583,622	1,682,694	1,578,833	1,652,999	0	0
Concrete	271,313	311,627	460,402	403,991	154,261	285,049	0	0
Cement	446,310	512,626	757,361	664,565	253,759	468,906	0	0
Sand	1,130,020	1,297,926	1,917,573	1,682,622	642,495	1,187,231	0	0
Gravel	1,475,831	1,695,120	2,504,394	2,197,542	839,113	1,550,550	0	0
Reinforcing Steel	68,703	91,924	199,555	166,372	23,969	99,303	0	0
Ballast	0	0	0	0	0	0	0	0
Sub-ballast	0	0	0	0	0	0	0	0
Fill	1,006,617	972,960	582,890	683,307	856,656	772,066	0	0
Concrete Railway Ties	0	0	0	0	0	0	0	0
Number of Miles Driven per Year 2014								
Excavation	5,800,873	5,820,704	4,750,867	5,048,082	4,736,498	4,958,998	0	0
Concrete	542,627	623,254	920,804	807,982	308,521	570,099	0	0
Cement	892,621	1,025,252	1,514,722	1,329,130	507,517	937,813	0	0
Sand	2,260,040	2,595,851	3,835,147	3,365,244	1,284,991	2,374,461	0	0
Gravel	2,951,662	3,390,240	5,008,788	4,395,084	1,678,227	3,101,100	0	0
Reinforcing Steel	137,406	183,847	399,109	332,743	47,937	198,606	0	0
Ballast	1,007,209	1,027,564	929,210	952,687	796,912	888,399	0	0
Sub-ballast	795,165	811,235	733,587	752,122	629,141	701,368	0	0
Fill	3,019,850	2,918,879	1,748,671	2,049,922	2,569,969	2,316,199	0	0
Concrete Railway Ties	529,910	540,619	488,873	501,225	419,269	467,402	0	0
Number of Miles Driven per Year 2015								
Excavation	3,867,249	3,880,469	3,167,245	3,365,388	3,157,665	3,305,999	0	0
Concrete	542,627	623,254	920,804	807,982	308,521	570,099	0	0
Cement	892,621	1,025,252	1,514,722	1,329,130	507,517	937,813	0	0
Sand	2,260,040	2,595,851	3,835,147	3,365,244	1,284,991	2,374,461	0	0
Gravel	2,951,662	3,390,240	5,008,788	4,395,084	1,678,227	3,101,100	0	0
Reinforcing Steel	137,406	183,847	399,109	332,743	47,937	198,606	0	0
Ballast	1,007,209	1,027,564	929,210	952,687	796,912	888,399	0	0
Sub-ballast	795,165	811,235	733,587	752,122	629,141	701,368	0	0
Fill	2,013,233	1,945,919	1,165,781	1,366,615	1,713,312	1,544,133	0	0
Concrete Railway Ties	529,910	540,619	488,873	501,225	419,269	467,402	0	0
Number of Miles Driven per Year 2016								
Excavation	0	0	0	0	0	0	0	0
Concrete	542,627	623,254	920,804	807,982	308,521	570,099	0	0
Cement	892,621	1,025,252	1,514,722	1,329,130	507,517	937,813	0	0
Sand	2,260,040	2,595,851	3,835,147	3,365,244	1,284,991	2,374,461	0	0
Gravel	2,951,662	3,390,240	5,008,788	4,395,084	1,678,227	3,101,100	0	0
Reinforcing Steel	137,406	183,847	399,109	332,743	47,937	198,606	0	0
Ballast	1,007,209	1,027,564	929,210	952,687	796,912	888,399	0	0
Sub-ballast	795,165	811,235	733,587	752,122	629,141	701,368	0	0
Fill	0	0	0	0	0	0	0	0
Concrete Railway Ties	529,910	540,619	488,873	501,225	419,269	467,402	0	0
Number of Miles Driven per Year 2017								
Excavation	0	0	0	0	0	0	0	0
Concrete	542,627	623,254	920,804	807,982	308,521	570,099	0	0
Cement	892,621	1,025,252	1,514,722	1,329,130	507,517	937,813	0	0
Sand	2,260,040	2,595,851	3,835,147	3,365,244	1,284,991	2,374,461	0	0
Gravel	2,951,662	3,390,240	5,008,788	4,395,084	1,678,227	3,101,100	0	0
Reinforcing Steel	137,406	183,847	399,109	332,743	47,937	198,606	0	0
Ballast	671,473	685,043	619,473	635,125	531,275	592,266	0	0
Sub-ballast	530,110	540,823	489,058	501,414	419,428	467,578	0	0
Fill	0	0	0	0	0	0	0	0
Concrete Railway Ties	353,273	360,413	325,915	334,150	279,513	311,601	0	0
Number of Miles Driven per Year 2018								
Excavation	0	0	0	0	0	0	12,656	0
Concrete	0	0	0	0	0	0	9,856	0
Cement	0	0	0	0	0	0	16,212	0
Sand	0	0	0	0	0	0	41,048	0
Gravel	0	0	0	0	0	0	53,610	0
Reinforcing Steel	0	0	0	0	0	0	1,331	0
Ballast	0	0	0	0	0	0	4,600	0
Sub-ballast	0	0	0	0	0	0	3,631	0
Fill	0	0	0	0	0	0	11,548	0
Concrete Railway Ties	0	0	0	0	0	0	1,980	0
Number of Miles Driven per Year 2021								
Excavation	0	0	0	0	0	0	0	1,307,600
Concrete	0	0	0	0	0	0	0	1,018,282
Cement	0	0	0	0	0	0	0	1,675,073
Sand	0	0	0	0	0	0	0	4,241,143
Gravel	0	0	0	0	0	0	0	5,539,028
Reinforcing Steel	0	0	0	0	0	0	0	137,516
Ballast	0	0	0	0	0	0	0	475,242
Sub-ballast	0	0	0	0	0	0	0	375,191
Fill	0	0	0	0	0	0	0	1,193,116
Concrete Railway Ties	0	0	0	0	0	0	0	204,572

B.1-57 SJVAB Material Hauling by Truck: Miles Traveled

This tab provides the data that will be used on the SJVAB Material Haul Emissions tab to calculate material hauling emissions from haul trucks. Assumptions are documented in the Data Request ('Material Hauling' tab).

Material Hauling Schedule

Material Type	BNSF, UPRR, and Hybrid Alternatives						LMF Track		HMF Track	
	Year of Activity					Total Duration (yrs)	Year of Activity	Total Duration (yrs)	Year of Activity	Total Duration (yrs)
	2013	2014	2015	2016	2017		2018		2021	
Excavation	0.3	1	0.7	0	0	2.0	0.5	0.5	0.5	0.5
Concrete	0.5	1	1	1	1	4.5	0.5	0.5	0.5	0.5
Cement	0.5	1	1	1	1	4.5	0.5	0.5	0.5	0.5
Sand	0.5	1	1	1	1	4.5	0.5	0.5	0.5	0.5
Gravel	0.5	1	1	1	1	4.5	0.5	0.5	0.5	0.5
Reinforcing Steel	0.5	1	1	1	1	4.5	0.5	0.5	0.5	0.5
Ballast	0	1	1	1	0.7	3.7	0.5	0.5	0.5	0.5
Sub-ballast	0	1	1	1	0.7	3.7	0.5	0.5	0.5	0.5
Fill	0.3	1	0.7	0	0	2.0	0.5	0.5	0.5	0.5
Concrete Railway Ties	0	1	1	1	0.7	3.0	0.5	0.5	0.5	0.5

Project-Life Calculations

Material Type	BNSF Ave 21	BNSF Ave 24	UPRR Ave 21	UPRR Ave 24	Hybrid Ave 24	Hybrid Ave 21	LMF Track	HMF Track
Total Number of Trucks for Project								
Excavation	96,681	97,012	79,181	84,135	78,942	82,650	105	10,897
Concrete	122,091	140,232	207,181	181,796	69,417	128,272	493	50,914
Cement	16,067	18,455	27,265	23,924	9,135	16,881	65	6,700
Sand	40,681	46,725	69,033	60,574	23,130	42,740	164	16,965
Gravel	53,130	61,024	90,158	79,112	30,208	55,820	214	22,156
Reinforcing Steel	5,153	6,894	14,967	12,478	1,798	7,448	11	1,146
Ballast	44,049	44,939	40,638	41,664	34,852	38,853	55	5,668
Sub-ballast	34,775	35,478	32,082	32,893	27,515	30,673	43	4,475
Fill	50,331	48,648	29,145	34,165	42,833	38,603	96	9,943
Concrete Railway Ties	6,624	6,758	6,111	6,265	5,241	5,843	8	852
Total Material Hauled								
Excavation (cy)	1,933,624	1,940,235	1,583,622	1,682,694	1,578,833	1,652,999	2,109	217,933
Concrete (cy)	1,709,274	1,963,249	2,900,531	2,545,143	971,842	1,795,811	6,899	712,797
Cement (tons)	482,015	553,636	817,950	717,730	274,059	506,419	1,945	201,009
Sand (tons)	1,220,421	1,401,760	2,070,979	1,817,232	693,895	1,282,209	4,926	508,937
Gravel (tons)	1,593,898	1,830,730	2,704,745	2,373,346	906,242	1,674,594	6,433	664,683
Reinforcing Steel (lb)	180,345,671	241,299,714	523,830,812	436,725,795	62,917,691	260,670,358	388,197	40,108,812
Ballast (cy)	880,975	898,779	812,751	833,287	697,035	777,056	1,097	113,367
Sub-ballast (cy)	695,507	709,562	641,646	657,858	550,291	613,465	866	89,500
Fill (cy)	1,006,617	972,960	582,890	683,307	856,656	772,066	1,925	198,853
Concrete Railway Ties (#)	231,836	236,521	213,882	219,286	183,430	204,488	289	29,833

Truck Capacity

20	cy/truck
35,000	lb/truck
30	tons/truck
14	cy/truck

Project Data

Material Hauled	Quantity for At-Grade	Quantity for Elevated [1]	Quantity for Retained Fill [2]	Units	Material Origin	Average RT Distance Traveled in the SJVAB
Excavation (Cut) [3]	4.5	3.1	0.4	cy / linear ft	Foothills	120
Concrete (Total)	0	10	80	cy / linear ft	Assume that this is from the batch plant.	20
Cement (to make concrete) [4]	0	564	564	lb / cy concrete	Assume within 125 miles of batch plant	250
Sand (to make concrete) [4]	0	1,428	1,428	lb / cy concrete	Assume within 125 miles of batch plant	250
Gravel (to make concrete) [4]	0	1,865	1,865	lb / cy concrete	Assume within 125 miles of batch plant	250
Reinforcing Steel	0	2,400	310	lb / linear ft	Bay Area Region (Port of Oakland)	120
Ballast [3, 5]	1.9	1.9	1.9	cy / linear ft	From Construction Site	84
Sub-ballast [3, 5]	1.5	1.5	1.5	cy / linear ft	From Construction Site	84
Fill [3]	2.1	0	17.5	cy / linear ft	Foothills	120
Concrete Railway Ties	0.5	0.5	0.5	# of ties / linear ft	Precast locations	240
Rail	264	264	264	lb / linear ft	Not applicable; likely up to 1,000 miles but only 1 delivery.	N/A

Note:
1. Elevated Concrete and Steel data provided by D. Fredericks to K. Skadberg (3/28/11).
2. Retained Fill Concrete and Steel data provided by V. Chio to K. Skadberg (3/22/11).
3. Excavation, Fill, Ballast, and Sub-ballast data for all track types provided by V. Chio to K. Skadberg (3/22/11).
4. Cement, Sand, and Gravel data taken from the composition of concrete (*BAAQMD Permit Handbook 11.5 Concrete Batch Plants*).
5. The VMT for hauling Ballast and Sub-ballast was based on the maximum possible alignment length; the haul trucks would travel from the alignment mid-point to the end of the alignment, and back.

B.1-58 SJVAB Material Hauling by Rail: Miles Traveled

This tab provides the data that will be used on the SJVAB Material Haul Emissions tab to calculate material hauling emissions from line-haul locomotives. Assumptions are documented in the Data Request ('Material Hauling' tab).

Ton-Miles Traveled Summary

Alternative	Total Ton-Miles for Material Hauling by Line-Haul Locomotive						
	2013	2014	2015	2016	2017	2018 [1]	2021 [2]
BNSF Ave 21	0	261,839,270	261,839,270	261,839,270	174,559,513	1,195,757	123,546,438
BNSF Ave 24	0	267,130,829	267,130,829	267,130,829	178,087,219	1,195,757	123,546,438
UPRR Ave 21	0	241,562,127	241,562,127	241,562,127	161,041,418	1,195,757	123,546,438
UPRR Ave 24	0	247,665,554	247,665,554	247,665,554	165,110,370	1,195,757	123,546,438
Hybrid Ave 24	0	207,169,482	207,169,482	207,169,482	138,112,988	1,195,757	123,546,438
Hybrid Ave 21	0	230,952,827	230,952,827	230,952,827	153,968,551	1,195,757	123,546,438

Notes:

1. 2018 is the year in which all of the LMF Track is constructed. This will hold true for all Alternatives.
2. 2021 is the year in which all of the HMF Track is constructed. This will hold true for all Alternatives.

Ton-Miles Traveled Calculations

Material Type	BNSF Ave 21	BNSF Ave 24	UPRR Ave 21	UPRR Ave 24	Hybrid Ave 24	Hybrid Ave 21	LMF Track	HMF Track
Number of Ton-Miles per Year 2013								
Ballast	0	0	0	0	0	0	0	0
Sub-ballast	0	0	0	0	0	0	0	0
Number of Ton-Miles per Year 2014								
Ballast	146,321,945	149,278,993	134,990,600	138,401,339	115,771,181	129,061,874	0	0
Sub-ballast	115,517,325	117,851,836	106,571,527	109,264,215	91,398,301	101,890,953	0	0
Number of Ton-Miles per Year 2015								
Ballast	146,321,945	149,278,993	134,990,600	138,401,339	115,771,181	129,061,874	0	0
Sub-ballast	115,517,325	117,851,836	106,571,527	109,264,215	91,398,301	101,890,953	0	0
Number of Ton-Miles per Year 2016								
Ballast	146,321,945	149,278,993	134,990,600	138,401,339	115,771,181	129,061,874	0	0
Sub-ballast	115,517,325	117,851,836	106,571,527	109,264,215	91,398,301	101,890,953	0	0
Number of Ton-Miles per Year 2017								
Ballast	97,547,963	99,519,328	89,993,734	92,267,559	77,180,788	86,041,249	0	0
Sub-ballast	77,011,550	78,567,891	71,047,684	72,842,810	60,932,201	67,927,302	0	0
Number of Ton-Miles per Year 2018								
Ballast	0	0	0	0	0	0	668,217	0
Sub-ballast	0	0	0	0	0	0	527,540	0
Number of Ton-Miles per Year 2021								
Ballast	0	0	0	0	0	0	0	69,040,656
Sub-ballast	0	0	0	0	0	0	0	54,505,781

B.1-58 SJVAB Material Hauling by Rail: Miles Traveled

This tab provides the data that will be used on the SJVAB Material Haul Emissions tab to calculate material hauling emissions from line-haul locomotives. Assumptions are documented in the Data Request ('Material Hauling' tab).

Material Hauling Schedule

Material Type	BNSF, UPRR, and Hybrid Alternatives						LMF Track		HMF Track	
	Year of Activity					Total Duration (yrs)	Year of Activity	Total Duration (yrs)	Year of Activity	Total Duration (yrs)
	2013	2014	2015	2016	2017		2018		2021	
Ballast	0	1	1	1	0.7	3.7	0.5	0.5	0.5	0.5
Sub-ballast	0	1	1	1	0.7	3.7	0.5	0.5	0.5	0.5

Project-Life Calculations

Material Type	BNSF Ave 21	BNSF Ave 24	UPRR Ave 21	UPRR Ave 24	Hybrid Ave 24	Hybrid Ave 21	LMF Track	HMF Track
Total Material Hauled								
Ballast (tons)	1,850,048	1,887,436	1,706,778	1,749,902	1,463,774	1,631,817	2,304	238,071
Sub-ballast (tons)	1,460,564	1,490,081	1,347,456	1,381,502	1,155,611	1,288,276	1,819	187,951
Total Material Hauled								
Ballast (cy)	880,975	898,779	812,751	833,287	697,035	777,056	1,097	113,367
Sub-ballast (cy)	695,507	709,562	641,646	657,858	550,291	613,465	866	89,500

Material Density

2.1 tons/cy

Project Data

Material Hauled	Quantity for At-Grade	Quantity for Elevated [1]	Quantity for Retained Fill [2]	Units	Material Origin	Average RT Distance Traveled in the SJVAB
Ballast [3, 5]	1.9	1.9	1.9	cy / linear ft	From SJVAB Border to Construction Site	290
Sub-ballast [3, 5]	1.5	1.5	1.5	cy / linear ft	From SJVAB Border to Construction Site	290

Note:

1. Ballast and Sub-ballast data for all track types provided by V. Chio to K. Skadberg (3/22/11).

2. The miles traveled for hauling Ballast and Sub-ballast was based on the maximum possible length from the edge of the SJVAB to the construction site (alignment mid-point). This distance will be traveled by line-haul locomotives.

B.1-59 SJVAB Material Hauling: Emission Factors

This tab provides the emission factors that will be used on the SJVAB Material Haul Emissions tab to calculate material hauling emissions.

Modeling Parameters:

Version : Emfac2007 V2.3 Nov 1 2006
Season : Annual
Area : San Joaquin Valley Unified APCD
Temperature : 67F
Relative Humidity : 55%

Unmitigated Emission Factors (g/mile) for Heavy Duty Trucks

Year [1]	MPH	ROG	CO	NO_2	SO_2	PM_{10} - Total [2]	$PM_{2.5}$ - Total [2]	CO_2	CH_4	PM_{10}	PM_{10} - Tire Wear	PM_{10} - Brake Wear	$PM_{2.5}$	$PM_{2.5}$ - Tire Wear	$PM_{2.5}$ - Brake Wear
2013	55	0.607	3.064	10.434	0.016	0.512	0.433	1649	0.029	0.448	0.036	0.028	0.412	0.009	0.012
2014	55	0.543	2.863	9.136	0.016	0.466	0.391	1648	0.026	0.402	0.036	0.028	0.37	0.009	0.012
2015	55	0.484	2.664	7.961	0.016	0.423	0.352	1648	0.023	0.359	0.036	0.028	0.331	0.009	0.012
2016	55	0.432	2.49	6.932	0.016	0.385	0.316	1648	0.021	0.321	0.036	0.028	0.295	0.009	0.012
2017	55	0.385	2.329	6.036	0.016	0.349	0.284	1648	0.019	0.285	0.036	0.028	0.263	0.009	0.012
2018	55	0.344	2.182	5.262	0.016	0.318	0.255	1648	0.017	0.254	0.036	0.028	0.234	0.009	0.012
2021	55	0.255	1.852	3.639	0.016	0.251	0.193	1648	0.013	0.187	0.036	0.028	0.172	0.009	0.012

Notes:

1. The unmitigated emission factors include 45 years of model year vehicles. For 2013, the assumed fleet mix includes model years 1969 to 2013; for 2014, the assumed fleet mix is 1970 to 2014, and so forth.
2. PM_{10} - Total and $PM_{2.5}$ - Total emission factors are the sum of the exhaust, tire wear, and brake wear emission factors.

Mitigated Emission Factors (g/mile) for Heavy Duty Trucks

Year [1]	MPH	ROG	CO	NO_2	SO_2	PM_{10} - Total [2]	$PM_{2.5}$ - Total [2]	CO_2	CH_4	PM_{10}	PM_{10} - Tire Wear	PM_{10} - Brake Wear	$PM_{2.5}$	$PM_{2.5}$ - Tire Wear	$PM_{2.5}$ - Brake Wear
2013	55	0.097	0.94	0.943	0.016	0.122	0.074	1642	0.005	0.058	0.036	0.028	0.053	0.009	0.012
2014	55	0.097	0.94	0.943	0.016	0.122	0.074	1642	0.005	0.058	0.036	0.028	0.053	0.009	0.012
2015	55	0.097	0.94	0.943	0.016	0.122	0.074	1642	0.005	0.058	0.036	0.028	0.053	0.009	0.012
2016	55	0.097	0.94	0.943	0.016	0.122	0.074	1642	0.005	0.058	0.036	0.028	0.053	0.009	0.012
2017	55	0.097	0.94	0.943	0.016	0.122	0.074	1642	0.005	0.058	0.036	0.028	0.053	0.009	0.012
2018	55	0.097	0.94	0.943	0.016	0.122	0.074	1642	0.005	0.058	0.036	0.028	0.053	0.009	0.012
2021	55	0.097	0.94	0.943	0.016	0.122	0.074	1642	0.005	0.058	0.036	0.028	0.053	0.009	0.012

Notes:

1. The mitigated emission factors assume all heavy duty trucks used for material hauling will meet the model year 2010 emission standards for on-road diesel vehicles throughout the construction period. As a result, the emission factors for each year modeled are identical.
2. PM_{10} - Total and $PM_{2.5}$ - Total emission factors are the sum of the exhaust, tire wear, and brake wear emission factors.

Unmitigated Emission Factors (g/gallon) for Line-Haul Locomotives

Year [1]	ROG [2]	CO [3]	NOx	SO_2 [4]	PM_{10}	$PM_{2.5}$ [5]	CO_2 [6]
2013	6.8	26.6	139.0	0.1	3.8	3.7	10,217.3
2014	6.4	26.6	135.0	0.1	3.6	3.5	10,217.3
2015	6.0	26.6	129.0	0.1	3.4	3.3	10,217.3
2016	5.4	26.6	121.0	0.1	3.1	3.0	10,217.3
2017	4.8	26.6	114.0	0.1	2.9	2.8	10,217.3
2018	4.4	26.6	108.0	0.1	2.7	2.6	10,217.3
2021	3.6	26.6	94.0	0.1	2.2	2.1	10,217.3

Notes:

1. Emission factors are for line-haul locomotives taken from or derived per the EPA document "Emission Factors for Locomotives" (April 2009). Mitigated emission factors were not available; as a result, mitigated material hauling by rail were considered equal to programmatic.
2. ROG emission factors were estimated by multiplying the available hydrocarbon emission factors by 1.053.
3. CO emission factors were estimated by multiplying the available emission factor (g/bhp-hr) by a conversion factor of 20.8 bhp-hr/gallon.
4. SO_2 emission factors were estimated using the following equation and the assumptions listed below: Emissions (g/gallon) = Fuel Density (g/gallon) x Conversion Factor x 64 g SO_2/32 g S x S Content of Fuel
   Assumed the density of diesel fuel was 3,200 g/gallon.
   Assumed the fuel's Sulfur would be 97.8% converted to SO_2.
   Assumed the locomotives operate using 15 ppm sulfur diesel, as required by California ARB.
5. $PM_{2.5}$ emission factors were estimated by assuming 97% of the PM_{10} was $PM_{2.5}$.
6. CO_2 emission factors were estimated using the following equation and the assumptions listed below: Emissions (g/gallon) = Fuel Density (g/gallon) x 44 g CO_2/12 g C x C Content of Fuel
   Assumed the fuel had a carbon content of 87% by mass.

B.1-60 Exhaust Mitigation for Construction Equipment

This tab provides data used to reduce exhaust-related emissions on Mitigated Tables located on other tabs throughout this workbook. Assumptions are documented on the applicable category tabs in the Data Request.

		ROG			NOX			PM		
Equipment	**Horsepower**	**Urbemis EF (g/hp-hr) [1]**	**AQMD Correlation [2]**	**Required % Reduction [3, 4]**	**Urbemis EF (g/hp-hr) [1]**	**AQMD Correlation [2]**	**Required % Reduction [3, 4]**	**Urbemis EF (g/hp-hr) [1]**	**AQMD Correlation [2]**	**Required % Reduction [3, 4]**
Excavator	168	0.349	Tier 1 - 2	60	2.581	Tier 3 - 4	88	0.148	Tier 3 - 4	90
Grader	174	0.411	Tier 1 - 2	66	3.134	Tier 2 - 3	90	0.177	Tier 3 - 4	92
Rubber Tired Dozer	357	0.407	Tier 1 - 2	66	3.46	Tier 2 - 3	91	0.144	Tier 3 - 4	90
Scrapers	313	0.406	Tier 1 - 2	66	3.604	Tier 2 - 3	92	0.14	Tier 3 - 4	89
Tractors/Loaders/Backhoes	108	0.42	Tier 1 - 2	67	2.761	Tier 3 - 4	89	0.232	Tier 1 - 2	94
Water Trucks	189	0.272	Tier 1 - 2	49	2.409	Tier 3 - 4	88	0.08	Tier 3 - 4	81
Pavers	100	0.707	Tier 1 - 2	80	4.259	Tier 2 - 3	93	0.372	Tier 1	96
Paving Equipment	104	0.602	Tier 1 - 2	77	3.629	Tier 2 - 3	92	0.317	Tier 1	95
Rollers	95	0.533	Tier 1 - 2	74	3.377	Tier 2 - 3	91	0.288	Tier 3 - 4	95
Cranes	399	0.211	Tier 2 - 3	34	1.933	Tier 3 - 4	84	0.07	Tier 3 - 4	79
Forklifts	145	0.173	Tier 2 - 3	19	1.287	Tier 4	77	0.074	Tier 3 - 4	80
Generator Sets	49	1.175	Tier 1 - 2	88	3.898	Tier 2 - 3	92	0.317	Tier 1 - 2	95
Welders	45	0.946	Tier 1 - 2	85	2.489	Tier 4	88	0.233	Tier 3 - 4	94
Fleet Average Reduction by Pollutant [5]				**63.76**			**88.90**			**89.86**

Notes:

1. URBEMIS EF is the unmitigated default value based on the equipment horsepower for a fleet mix in 2013. 2013 was chosen as the fleet mix year as a conservative estimate since it is the first year of construction activities.

2. SCAQMD Correlation taken from TABLE II - OFF-ROAD ENGINE EMISSION RATES & COMPARISON OF UNCONTROLLED TO TIERED RATES AND TIERED TO TIERED RATES. Tier 1-2 means the Urbemis EF falls between AQMD Tiers 1 and 2, etc.

3. Required % Reduction was calculated and indicates the % reduction required to reduce the default URBEMIS emission factors to the Tier 4 standards for each pollutant. For NOx, the Tier 4 standard to be met was taken as the final standard (not the interim standard).

4. The SCAQMD Tier 4 standards that each equipment piece will meet are as follows:

Tier 4 Emission Standards (g/ bhp hr)		
ROG	NOx	PM
0.14	0.3	0.015

5. The Fleet Average Reduction was taken as the average of reductions required for all construction equipment to meet Tier 4 standards. This average reduction will be applied to exhaust emissions from off-road construction equipment.

B.2 URBEMIS2007 Output

B.2-1 Mobilization

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Mobilization.urb924

Project Name: Mobilization

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	21.12	242.58	79.67	0.00	0.02	8.30	8.32	0.01	7.86	7.87	30,952.48
2013 TOTALS (tons/year mitigated)	21.12	242.58	79.67	0.00	0.02	8.30	8.32	0.01	7.86	7.87	30,952.48
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	21.12	242.58	79.67	0.00	0.02	8.30	8.32	0.01	7.86	7.87	30,952.48
Mass Grading 03/01/2013-10/31/2013	21.12	242.58	79.67	0.00	0.02	8.30	8.32	0.01	7.86	7.87	30,952.48
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	21.01	242.39	76.13	0.00	0.00	8.28	8.28	0.00	7.85	7.85	30,526.83
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.11	0.18	3.54	0.00	0.02	0.01	0.03	0.01	0.01	0.02	425.65

Phase Assumptions

Phase: Mass Grading 3/1/2013 - 10/31/2013 - Mobilization

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off Road Diesel calculated using the Named Equipment EMS functions.

The Off Road Equipment was based on the Named Equipment List: C:\Documents and Settings\Avanti_Tamhane\Application Data\Urbemis\Version9a\Data\const equip_2005 manf year.equip;Mobilization Equipment List
Off-Road Equipment:

30 Off Highway Trucks (175 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

30 Off Highway Trucks (210 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

60 Off Highway Tractors (500 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

10 Off Highway Trucks (300 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

10 Water Trucks (210 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

20 Other Equipment (10 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

10 Off Highway Trucks (200 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

10 Off Highway Trucks (330 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

4 Tractors/Loaders/Backhoes (87 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year
2 Excavators (300 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

4/11/2011 12:13:11 PM

4 Rubber Tired Dozers (125 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1400 hrs/year

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	21.12	242.58	79.67	0.00	0.02	8.30	8.32	0.01	7.86	7.87	30,952.48
Mass Grading 03/01/2013-10/31/2013	21.12	242.58	79.67	0.00	0.02	8.30	8.32	0.01	7.86	7.87	30,952.48
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	21.01	242.39	76.13	0.00	0.00	8.28	8.28	0.00	7.85	7.85	30,526.83
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.11	0.18	3.54	0.00	0.02	0.01	0.03	0.01	0.01	0.02	425.65

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 3/1/2013 - 10/31/2013 - Mobilization:

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

B.2-2 Site Preparation

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Demolition - BNSF.urb924

Project Name: Demolition - BNSF

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	7.90	108.90	39.04	0.19	151.07	4.10	155.16	31.51	3.77	35.27	20,253.07

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	7.90	108.90	39.04	0.19	151.07	4.10	155.16	31.51	3.77	35.27	20,253.07
Demolition 04/01/2013-08/30/2013	7.90	108.90	39.04	0.19	151.07	4.10	155.16	31.51	3.77	35.27	20,253.07
Fugitive Dust	0.00	0.00	0.00	0.00	150.39	0.00	150.39	31.28	0.00	31.28	0.00
Demo Off Road Diesel	0.26	2.13	1.27	0.00	0.00	0.10	0.10	0.00	0.09	0.09	227.28
Demo On Road Diesel	7.63	106.76	37.71	0.19	0.70	4.00	4.70	0.23	3.68	3.91	20,018.75
Demo Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Demolition 4/1/2013 - 8/30/2013 - Demolition

Building Volume Total (cubic feet): 7.161222E+08

Building Volume Daily (cubic feet): 6509262

On Road Truck Travel (VMT): 90406.41

Off-Road Equipment:

3 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Demolition - UPRR.urb924

Project Name: Demolition - UPRR

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	10.96	151.66	54.14	0.26	211.57	5.70	217.27	44.13	5.24	49.37	28,271.22

6/3/2011 1:17:49 PM

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	10.96	151.66	54.14	0.26	211.57	5.70	217.27	44.13	5.24	49.37	28,271.22
Demolition 04/01/2013-08/30/2013	10.96	151.66	54.14	0.26	211.57	5.70	217.27	44.13	5.24	49.37	28,271.22
Fugitive Dust	0.00	0.00	0.00	0.00	210.61	0.00	210.61	43.81	0.00	43.81	0.00
Demo Off Road Diesel	0.26	2.13	1.27	0.00	0.00	0.10	0.10	0.00	0.09	0.09	227.28
Demo On Road Diesel	10.69	149.53	52.81	0.26	0.98	5.60	6.58	0.32	5.15	5.47	28,036.90
Demo Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Demolition 4/1/2013 - 8/30/2013 - Demolition

Building Volume Total (cubic feet): 1.002882E+09

Building Volume Daily (cubic feet): 9116430

On Road Truck Travel (VMT): 126617.08

Off-Road Equipment:

3 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

6/3/2011 10:56:42 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Demolition - Hybrid.urb924

Project Name: Demolition - Hybrid

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	8.90	122.88	43.98	0.21	170.85	4.62	175.47	35.63	4.25	39.88	22,874.50

6/3/2011 10:56:42 AM

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	8.90	122.88	43.98	0.21	170.85	4.62	175.47	35.63	4.25	39.88	22,874.50
Demolition 04/01/2013-08/30/2013	8.90	122.88	43.98	0.21	170.85	4.62	175.47	35.63	4.25	39.88	22,874.50
Fugitive Dust	0.00	0.00	0.00	0.00	170.06	0.00	170.06	35.37	0.00	35.37	0.00
Demo Off Road Diesel	0.26	2.13	1.27	0.00	0.00	0.10	0.10	0.00	0.09	0.09	227.28
Demo On Road Diesel	8.63	120.74	42.65	0.21	0.79	4.52	5.31	0.26	4.16	4.42	22,640.17
Demo Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Demolition 4/1/2013 - 8/30/2013 - Demolition

Building Volume Total (cubic feet): 8.0982E+08

Building Volume Daily (cubic feet): 7361640

On Road Truck Travel (VMT): 102245

Off-Road Equipment:

3 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

6/3/2011 1:20:16 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Demolition - HMF CCC.urb924

Project Name: Demolition - HMF CCC

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	1.88	24.66	9.29	0.04	31.87	0.94	32.82	6.65	0.87	7.51	4,458.25

6/3/2011 1:20:16 PM

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	1.88	24.66	9.29	0.04	31.87	0.94	32.82	6.65	0.87	7.51	4,458.25
Demolition 04/01/2013-08/30/2013	1.88	24.66	9.29	0.04	31.87	0.94	32.82	6.65	0.87	7.51	4,458.25
Fugitive Dust	0.00	0.00	0.00	0.00	31.71	0.00	31.71	6.60	0.00	6.60	0.00
Demo Off Road Diesel	0.26	2.13	1.27	0.00	0.00	0.10	0.10	0.00	0.09	0.09	227.28
Demo On Road Diesel	1.61	22.53	7.96	0.04	0.15	0.84	0.99	0.05	0.78	0.82	4,223.92
Demo Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Demolition 4/1/2013 - 8/30/2013 - Demolition

Building Volume Total (cubic feet): 1.509944E+08

Building Volume Daily (cubic feet): 1373444

On Road Truck Travel (VMT): 19075.61

Off-Road Equipment:

3 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

3/29/2011 10:29:14 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\BNSF Ave 21 - Site Prep - Programmatic.urb924

Project Name: BNSF Ave 21 - Site Prep - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	84.89	0.00	70.84	84.85	0.00	45.29	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1188.31

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

3/29/2011 10:29:14 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:32:44 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\BNSF Ave 21 - Site Prep - Mitigated.urb924

Project Name: BNSF Ave 21 - Site Prep - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	86.29	0.00	72.00	86.25	0.00	46.04	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1188.31

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:31:29 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\BNSF Ave 24 - Site Prep - Programmatic.urb924

Project Name: BNSF Ave 24 - Site Prep - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	84.89	0.00	70.84	84.85	0.00	45.29	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1219.51

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

3/29/2011 10:31:29 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:34:06 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\BNSF Ave 24 - Site Prep - Mitigated.urb924

Project Name: BNSF Ave 24 - Site Prep - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	86.29	0.00	72.00	86.25	0.00	46.04	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

3/29/2011 10:34:06 AM

2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1219.51

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

3/29/2011 10:34:06 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:35:44 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\UPRR Ave 21 - Site Prep - Programmatic.urb924

Project Name: UPRR Ave 21 - Site Prep - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	84.89	0.00	70.84	84.85	0.00	45.29	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

3/29/2011 10:35:44 AM

2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1051.87

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

3/29/2011 10:35:44 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:41:24 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\UPRR Ave 21 - Site Prep - Mitigated.urb924

Project Name: UPRR Ave 21 - Site Prep - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	86.29	0.00	72.00	86.25	0.00	46.04	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1051.87

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:39:28 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\UPRR Ave 24 - Site Prep - Programmatic.urb924

Project Name: UPRR Ave 24 - Site Prep - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	84.89	0.00	70.84	84.85	0.00	45.29	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1081.64

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:42:51 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\UPRR Ave 24 - Site Prep - Mitigated.urb924

Project Name: UPRR Ave 24 - Site Prep - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	86.29	0.00	72.00	86.25	0.00	46.04	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1081.64

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

3/29/2011 10:42:51 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:44:35 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Hybrid - Site Prep - Programmatic.urb924

Project Name: Hybrid - Site Prep - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	84.89	0.00	70.84	84.85	0.00	45.29	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

3/29/2011 10:44:35 AM

2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 932.09

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

3/29/2011 10:44:35 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 10:45:47 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Hybrid - Site Prep - Mitigated.urb924

Project Name: Hybrid - Site Prep - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	86.29	0.00	72.00	86.25	0.00	46.04	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 932.09

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Hybrid Ave 21 - Site Prep - Programmatic.urb924

Project Name: Hybrid Ave 21 - Site Prep - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	84.89	0.00	70.84	84.85	0.00	45.29	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1058.29

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.19	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Hybrid Ave 21 - Site Prep - Mitigated.urb924

Project Name: Hybrid Ave 21 - Site Prep - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
2013 TOTALS (tons/year mitigated)	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Percent Reduction	0.00	0.00	0.00	0.00	86.29	0.00	72.00	86.25	0.00	46.04	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.55	0.11	0.66	0.11	0.10	0.22	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Phase Assumptions

Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

Total Acres Disturbed: 1058.29

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading 04/01/2013-08/30/2013	0.32	2.66	1.38	0.00	0.08	0.11	0.18	0.02	0.10	0.12	293.29
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.66	1.32	0.00	0.00	0.11	0.11	0.00	0.10	0.10	286.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 4/1/2013 - 8/30/2013 - Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

B.2-3 Earth Moving

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\BNSF Ave 21 - Earth Move - Programmatic.urb924

Project Name: BNSF Ave 21 - Earth Move - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	128.20	0.21	128.41	26.77	0.20	26.97	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	19.30	0.21	19.52	4.03	0.20	4.23	523.60
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.80	84.94	0.00	84.32	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	383.07	0.20	383.27	80.00	0.18	80.18	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	57.68	0.20	57.87	12.05	0.18	12.23	502.72
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.90	84.94	0.00	84.75	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	253.83	0.07	253.90	53.01	0.06	53.08	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	38.22	0.07	38.29	7.98	0.06	8.05	203.26
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.92	84.94	0.00	84.84	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	128.20	0.21	128.41	26.77	0.20	26.97	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	127.65	0.04	127.69	26.66	0.04	26.70	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	127.65	0.00	127.65	26.66	0.00	26.66	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	383.07	0.20	383.27	80.00	0.18	80.18	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	382.95	0.12	383.07	79.98	0.11	80.08	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	382.95	0.00	382.95	79.98	0.00	79.98	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	253.83	0.07	253.90	53.01	0.06	53.08	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	253.83	0.07	253.90	53.01	0.06	53.08	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	253.83	0.00	253.83	53.01	0.00	53.01	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1188.31

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 5250 cubic yards/day; Offsite Cut/Fill: 5250 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1188.31

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	19.30	0.21	19.52	4.03	0.20	4.23	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	19.22	0.04	19.26	4.01	0.04	4.05	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	19.22	0.00	19.22	4.01	0.00	4.01	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	57.68	0.20	57.87	12.05	0.18	12.23	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	57.66	0.12	57.77	12.04	0.11	12.15	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	57.66	0.00	57.66	12.04	0.00	12.04	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	38.22	0.07	38.29	7.98	0.06	8.05	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	38.22	0.07	38.29	7.98	0.06	8.05	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	38.22	0.00	38.22	7.98	0.00	7.98	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\BNSF Ave 21 - Earth Move - Mitigated.urb924

Project Name: BNSF Ave 21 - Earth Move - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	27.71	0.21	27.93	5.79	0.20	5.98	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	3.79	0.21	4.00	0.79	0.20	0.99	523.60
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	85.68	86.34	0.00	83.50	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	81.61	0.20	81.81	17.04	0.18	17.23	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	11.15	0.20	11.35	2.33	0.18	2.51	502.72
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.13	86.34	0.00	85.42	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	54.02	0.07	54.09	11.28	0.06	11.35	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	7.38	0.07	7.45	1.54	0.06	1.61	203.26
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.23	86.34	0.00	85.85	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	27.71	0.21	27.93	5.79	0.20	5.98	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	27.17	0.04	27.21	5.67	0.04	5.71	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	27.17	0.00	27.17	5.67	0.00	5.67	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	81.61	0.20	81.81	17.04	0.18	17.23	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	81.50	0.12	81.61	17.02	0.11	17.13	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	81.50	0.00	81.50	17.02	0.00	17.02	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	54.02	0.07	54.09	11.28	0.06	11.35	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	54.02	0.07	54.09	11.28	0.06	11.35	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	54.02	0.00	54.02	11.28	0.00	11.28	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1188.31

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1188.31

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 5250 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	3.79	0.21	4.00	0.79	0.20	0.99	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	3.71	0.04	3.75	0.78	0.04	0.81	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	3.71	0.00	3.71	0.77	0.00	0.77	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

2014	0.53	4.09	2.49	0.00	11.15	0.20	11.35	2.33	0.18	2.51	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	11.13	0.12	11.25	2.33	0.11	2.43	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	11.13	0.00	11.13	2.32	0.00	2.32	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	7.38	0.07	7.45	1.54	0.06	1.61	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	7.38	0.07	7.45	1.54	0.06	1.61	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	7.38	0.00	7.38	1.54	0.00	1.54	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\BNSF Ave 24 - Earth Move - Programmatic.urb924

Project Name: BNSF Ave 24 - Earth Move - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	127.03	0.21	127.25	26.53	0.20	26.73	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	19.13	0.21	19.34	3.99	0.20	4.19	523.60
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.80	84.94	0.00	84.32	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	379.57	0.20	379.77	79.27	0.18	79.45	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	57.15	0.20	57.35	11.94	0.18	12.12	502.72
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.90	84.94	0.00	84.75	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	251.52	0.07	251.59	52.53	0.06	52.59	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	37.87	0.07	37.94	7.91	0.06	7.97	203.26
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.92	84.94	0.00	84.84	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	127.03	0.21	127.25	26.53	0.20	26.73	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	126.49	0.04	126.53	26.42	0.04	26.45	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	126.49	0.00	126.49	26.42	0.00	26.42	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	379.57	0.20	379.77	79.27	0.18	79.45	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	379.46	0.12	379.57	79.25	0.11	79.35	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	379.46	0.00	379.46	79.25	0.00	79.25	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	251.52	0.07	251.59	52.53	0.06	52.59	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	251.52	0.07	251.59	52.53	0.06	52.59	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	251.52	0.00	251.52	52.53	0.00	52.53	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1219.51

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1219.51

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 5202 cubic yards/day; Offsite Cut/Fill: 5202 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	19.13	0.21	19.34	3.99	0.20	4.19	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	19.04	0.04	19.09	3.98	0.04	4.02	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	19.04	0.00	19.04	3.98	0.00	3.98	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

2014	0.53	4.09	2.49	0.00	57.15	0.20	57.35	11.94	0.18	12.12	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	57.13	0.12	57.25	11.93	0.11	12.04	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	57.13	0.00	57.13	11.93	0.00	11.93	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	37.87	0.07	37.94	7.91	0.06	7.97	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	37.87	0.07	37.94	7.91	0.06	7.97	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	37.87	0.00	37.87	7.91	0.00	7.91	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\BNSF Ave 24 - Earth Move - Mitigated.urb924

Project Name: BNSF Ave 24 - Earth Move - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	27.47	0.21	27.68	5.74	0.20	5.93	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	3.75	0.21	3.97	0.78	0.20	0.98	523.60
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	85.67	86.34	0.00	83.47	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	80.87	0.20	81.07	16.89	0.18	17.07	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	11.05	0.20	11.25	2.31	0.18	2.49	502.72
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.13	86.34	0.00	85.42	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	53.53	0.07	53.60	11.18	0.06	11.24	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	7.31	0.07	7.38	1.53	0.06	1.59	203.26
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.23	86.34	0.00	85.84	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	27.47	0.21	27.68	5.74	0.20	5.93	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	26.92	0.04	26.96	5.62	0.04	5.66	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	26.92	0.00	26.92	5.62	0.00	5.62	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	80.87	0.20	81.07	16.89	0.18	17.07	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	80.76	0.12	80.87	16.87	0.11	16.97	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	80.76	0.00	80.76	16.87	0.00	16.87	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	53.53	0.07	53.60	11.18	0.06	11.24	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	53.53	0.07	53.60	11.18	0.06	11.24	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	53.53	0.00	53.53	11.18	0.00	11.18	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1219.51

3/29/2011 1:59:11 PM

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1219.51

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 5202 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

3/29/2011 1:59:11 PM

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	3.75	0.21	3.97	0.78	0.20	0.98	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	3.68	0.04	3.72	0.77	0.04	0.81	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	3.68	0.00	3.68	0.77	0.00	0.77	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

2014	0.53	4.09	2.49	0.00	11.05	0.20	11.25	2.31	0.18	2.49	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	11.03	0.12	11.15	2.30	0.11	2.41	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	11.03	0.00	11.03	2.30	0.00	2.30	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	7.31	0.07	7.38	1.53	0.06	1.59	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	7.31	0.07	7.38	1.53	0.06	1.59	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	7.31	0.00	7.31	1.53	0.00	1.53	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/29/2011 2:04:19 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\UPRR Ave 21 - Earth Move - Programmatic.urb924

Project Name: UPRR Ave 21 - Earth Move - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	94.68	0.21	94.89	19.77	0.20	19.97	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	14.26	0.21	14.47	2.98	0.20	3.17	523.60
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.75	84.94	0.00	84.11	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	282.51	0.20	282.70	59.00	0.18	59.18	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	42.53	0.20	42.73	8.88	0.18	9.07	502.72
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.88	84.94	0.00	84.68	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	187.18	0.07	187.25	39.09	0.06	39.15	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	28.18	0.07	28.25	5.89	0.06	5.95	203.26
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.91	84.94	0.00	84.80	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	94.68	0.21	94.89	19.77	0.20	19.97	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	94.13	0.04	94.17	19.66	0.04	19.70	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	94.13	0.00	94.13	19.66	0.00	19.66	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	282.51	0.20	282.70	59.00	0.18	59.18	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	282.39	0.12	282.51	58.97	0.11	59.08	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	282.39	0.00	282.39	58.97	0.00	58.97	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	187.18	0.07	187.25	39.09	0.06	39.15	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	187.18	0.07	187.25	39.09	0.06	39.15	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	187.18	0.00	187.18	39.09	0.00	39.09	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1051.87

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1051.87

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 3869 cubic yards/day; Offsite Cut/Fill: 3869 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	14.26	0.21	14.47	2.98	0.20	3.17	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	14.17	0.04	14.22	2.96	0.04	3.00	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	14.17	0.00	14.17	2.96	0.00	2.96	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	42.53	0.20	42.73	8.88	0.18	9.07	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	42.52	0.12	42.63	8.88	0.11	8.99	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	42.52	0.00	42.52	8.88	0.00	8.88	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	28.18	0.07	28.25	5.89	0.06	5.95	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	28.18	0.07	28.25	5.89	0.06	5.95	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	28.18	0.00	28.18	5.89	0.00	5.89	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

3/29/2011 2:04:20 PM

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\UPRR Ave 21 - Earth Move - Mitigated.urb924

Project Name: UPRR Ave 21 - Earth Move - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	20.62	0.21	20.84	4.31	0.20	4.50	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	2.82	0.21	3.03	0.59	0.20	0.79	523.60
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	85.45	86.33	0.00	82.56	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	60.35	0.20	60.55	12.60	0.18	12.79	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	8.24	0.20	8.44	1.72	0.18	1.90	502.72
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.06	86.34	0.00	85.11	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	39.92	0.07	39.99	8.34	0.06	8.40	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	5.45	0.07	5.52	1.14	0.06	1.20	203.26
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.19	86.34	0.00	85.67	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	20.62	0.21	20.84	4.31	0.20	4.50	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	20.08	0.04	20.12	4.19	0.04	4.23	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	20.08	0.00	20.08	4.19	0.00	4.19	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	60.35	0.20	60.55	12.60	0.18	12.79	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	60.23	0.12	60.35	12.58	0.11	12.69	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	60.23	0.00	60.23	12.58	0.00	12.58	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	39.92	0.07	39.99	8.34	0.06	8.40	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	39.92	0.07	39.99	8.34	0.06	8.40	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	39.92	0.00	39.92	8.34	0.00	8.34	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1051.87

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1051.87

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 3869 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	2.82	0.21	3.03	0.59	0.20	0.79	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	2.74	0.04	2.79	0.57	0.04	0.61	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	2.74	0.00	2.74	0.57	0.00	0.57	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	8.24	0.20	8.44	1.72	0.18	1.90	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	8.23	0.12	8.34	1.72	0.11	1.83	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	8.23	0.00	8.23	1.72	0.00	1.72	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	5.45	0.07	5.52	1.14	0.06	1.20	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	5.45	0.07	5.52	1.14	0.06	1.20	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	5.45	0.00	5.45	1.14	0.00	1.14	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\UPRR Ave 24 - Earth Move - Programmatic.urb924

Project Name: UPRR Ave 24 - Earth Move - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	103.32	0.21	103.53	21.58	0.20	21.77	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	15.56	0.21	15.77	3.25	0.20	3.45	523.60
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.77	84.94	0.00	84.18	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	308.43	0.20	308.63	64.41	0.18	64.59	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	46.44	0.20	46.64	9.70	0.18	9.88	502.72
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.89	84.94	0.00	84.70	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	204.36	0.07	204.43	42.68	0.06	42.74	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	30.77	0.07	30.84	6.43	0.06	6.49	203.26
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.91	84.94	0.00	84.82	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	103.32	0.21	103.53	21.58	0.20	21.77	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	102.77	0.04	102.81	21.46	0.04	21.50	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	102.77	0.00	102.77	21.46	0.00	21.46	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	308.43	0.20	308.63	64.41	0.18	64.59	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	308.31	0.12	308.43	64.39	0.11	64.49	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	308.31	0.00	308.31	64.39	0.00	64.39	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	204.36	0.07	204.43	42.68	0.06	42.74	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	204.36	0.07	204.43	42.68	0.06	42.74	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	204.36	0.00	204.36	42.68	0.00	42.68	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1081.64

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1081.64

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 4225 cubic yards/day; Offsite Cut/Fill: 4225 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	15.56	0.21	15.77	3.25	0.20	3.45	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	15.47	0.04	15.52	3.23	0.04	3.27	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	15.47	0.00	15.47	3.23	0.00	3.23	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	46.44	0.20	46.64	9.70	0.18	9.88	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	46.42	0.12	46.54	9.69	0.11	9.80	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	46.42	0.00	46.42	9.69	0.00	9.69	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	30.77	0.07	30.84	6.43	0.06	6.49	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	30.77	0.07	30.84	6.43	0.06	6.49	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	30.77	0.00	30.77	6.43	0.00	6.43	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\UPRR Ave 24 - Earth Move - Mitigated.urb924

Project Name: UPRR Ave 24 - Earth Move - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	22.45	0.21	22.66	4.69	0.20	4.89	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	3.07	0.21	3.28	0.64	0.20	0.84	523.60
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	85.52	86.33	0.00	82.86	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	65.83	0.20	66.03	13.75	0.18	13.93	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	8.99	0.20	9.19	1.88	0.18	2.06	502.72
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.08	86.34	0.00	85.21	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	43.56	0.07	43.63	9.10	0.06	9.16	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	5.95	0.07	6.02	1.24	0.06	1.31	203.26
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.20	86.34	0.00	85.73	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	22.45	0.21	22.66	4.69	0.20	4.89	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	21.90	0.04	21.95	4.57	0.04	4.61	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	21.90	0.00	21.90	4.57	0.00	4.57	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	65.83	0.20	66.03	13.75	0.18	13.93	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	65.71	0.12	65.83	13.72	0.11	13.83	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	65.71	0.00	65.71	13.72	0.00	13.72	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	43.56	0.07	43.63	9.10	0.06	9.16	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	43.56	0.07	43.63	9.10	0.06	9.16	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	43.56	0.00	43.56	9.10	0.00	9.10	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1081.64

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1081.64

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 4225 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	3.07	0.21	3.28	0.64	0.20	0.84	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	2.99	0.04	3.04	0.62	0.04	0.66	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	2.99	0.00	2.99	0.62	0.00	0.62	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

2014	0.53	4.09	2.49	0.00	8.99	0.20	9.19	1.88	0.18	2.06	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	8.98	0.12	9.09	1.87	0.11	1.98	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	8.98	0.00	8.98	1.87	0.00	1.87	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	5.95	0.07	6.02	1.24	0.06	1.31	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	5.95	0.07	6.02	1.24	0.06	1.31	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	5.95	0.00	5.95	1.24	0.00	1.24	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Hybrid - Earth Move - Programmatic.urb924

Project Name: Hybrid - Earth Move - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	106.33	0.21	106.54	22.21	0.20	22.40	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	16.01	0.21	16.22	3.34	0.20	3.54	523.60
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.77	84.94	0.00	84.20	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	317.46	0.20	317.66	66.30	0.18	66.48	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	47.80	0.20	48.00	9.98	0.18	10.16	502.72
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.89	84.94	0.00	84.71	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	210.35	0.07	210.42	43.93	0.06	43.99	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	31.67	0.07	31.74	6.61	0.06	6.68	203.26
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.92	84.94	0.00	84.82	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	106.33	0.21	106.54	22.21	0.20	22.40	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	105.78	0.04	105.82	22.09	0.04	22.13	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	105.78	0.00	105.78	22.09	0.00	22.09	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	317.46	0.20	317.66	66.30	0.18	66.48	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	317.34	0.12	317.46	66.27	0.11	66.38	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	317.34	0.00	317.34	66.27	0.00	66.27	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	210.35	0.07	210.42	43.93	0.06	43.99	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	210.35	0.07	210.42	43.93	0.06	43.99	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	210.35	0.00	210.35	43.93	0.00	43.93	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 932.09

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 932.09

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 4349 cubic yards/day; Offsite Cut/Fill: 4349 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	16.01	0.21	16.22	3.34	0.20	3.54	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	15.93	0.04	15.97	3.33	0.04	3.37	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	15.93	0.00	15.93	3.33	0.00	3.33	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

2014	0.53	4.09	2.49	0.00	47.80	0.20	48.00	9.98	0.18	10.16	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	47.78	0.12	47.90	9.98	0.11	10.09	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	47.78	0.00	47.78	9.98	0.00	9.98	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	31.67	0.07	31.74	6.61	0.06	6.68	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	31.67	0.07	31.74	6.61	0.06	6.68	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	31.67	0.00	31.67	6.61	0.00	6.61	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Hybrid - Earth Move - Mitigated.urb924

Project Name: Hybrid - Earth Move - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	23.09	0.21	23.30	4.82	0.20	5.02	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	3.15	0.21	3.37	0.66	0.20	0.86	523.60
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	85.54	86.33	0.00	82.95	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	67.74	0.20	67.94	14.15	0.18	14.33	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	9.25	0.20	9.45	1.93	0.18	2.12	502.72
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.09	86.34	0.00	85.24	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	44.82	0.07	44.89	9.36	0.06	9.43	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	6.12	0.07	6.19	1.28	0.06	1.34	203.26
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.20	86.34	0.00	85.75	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	23.09	0.21	23.30	4.82	0.20	5.02	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	22.54	0.04	22.58	4.71	0.04	4.75	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	22.54	0.00	22.54	4.71	0.00	4.71	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	67.74	0.20	67.94	14.15	0.18	14.33	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	67.62	0.12	67.74	14.12	0.11	14.23	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	67.62	0.00	67.62	14.12	0.00	14.12	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	44.82	0.07	44.89	9.36	0.06	9.43	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	44.82	0.07	44.89	9.36	0.06	9.43	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	44.82	0.00	44.82	9.36	0.00	9.36	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 932.09

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 932.09

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 4349 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	3.15	0.21	3.37	0.66	0.20	0.86	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	3.08	0.04	3.12	0.64	0.04	0.68	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	3.08	0.00	3.08	0.64	0.00	0.64	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	9.25	0.20	9.45	1.93	0.18	2.12	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	9.24	0.12	9.35	1.93	0.11	2.04	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	9.24	0.00	9.24	1.93	0.00	1.93	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	6.12	0.07	6.19	1.28	0.06	1.34	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	6.12	0.07	6.19	1.28	0.06	1.34	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	6.12	0.00	6.12	1.28	0.00	1.28	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

3/29/2011 2:15:38 PM

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Hybrid Ave 21 - Earth Move - Programmatic.urb924

Project Name: Hybrid Ave 21 - Earth Move - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	105.87	0.21	106.08	22.11	0.20	22.31	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	15.94	0.21	16.15	3.33	0.20	3.53	523.60
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.77	84.94	0.00	84.19	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	316.07	0.20	316.27	66.01	0.18	66.19	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	47.59	0.20	47.79	9.94	0.18	10.12	502.72
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.89	84.94	0.00	84.71	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	209.43	0.07	209.50	43.74	0.06	43.80	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	31.53	0.07	31.60	6.59	0.06	6.65	203.26
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.92	84.94	0.00	84.82	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	105.87	0.21	106.08	22.11	0.20	22.31	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	105.32	0.04	105.36	22.00	0.04	22.03	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	105.32	0.00	105.32	21.99	0.00	21.99	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	316.07	0.20	316.27	66.01	0.18	66.19	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	315.96	0.12	316.08	65.99	0.11	66.09	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	315.96	0.00	315.96	65.98	0.00	65.98	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	209.43	0.07	209.50	43.74	0.06	43.80	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	209.43	0.07	209.50	43.74	0.06	43.80	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	209.43	0.00	209.43	43.74	0.00	43.74	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1058.29

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1058.29

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 4330 cubic yards/day; Offsite Cut/Fill: 4330 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	15.94	0.21	16.15	3.33	0.20	3.53	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	15.86	0.04	15.90	3.31	0.04	3.35	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	15.86	0.00	15.86	3.31	0.00	3.31	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	47.59	0.20	47.79	9.94	0.18	10.12	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	47.57	0.12	47.69	9.93	0.11	10.04	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	47.57	0.00	47.57	9.93	0.00	9.93	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	31.53	0.07	31.60	6.59	0.06	6.65	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	31.53	0.07	31.60	6.59	0.06	6.65	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	31.53	0.00	31.53	6.58	0.00	6.58	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Hybrid Ave 21 - Earth Move - Mitigated.urb924

Project Name: Hybrid Ave 21 - Earth Move - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.57	4.65	2.68	0.00	22.99	0.21	23.20	4.80	0.20	5.00	523.60
2013 TOTALS (tons/year mitigated)	0.57	4.65	2.68	0.00	3.14	0.21	3.35	0.66	0.20	0.85	523.60
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	85.54	86.33	0.00	82.94	0.00
2014 TOTALS (tons/year unmitigated)	0.53	4.09	2.49	0.00	67.45	0.20	67.64	14.09	0.18	14.27	502.72
2014 TOTALS (tons/year mitigated)	0.53	4.09	2.49	0.00	9.21	0.20	9.41	1.92	0.18	2.11	502.72
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.09	86.34	0.00	85.23	0.00
2015 TOTALS (tons/year unmitigated)	0.20	1.52	0.96	0.00	44.63	0.07	44.70	9.32	0.06	9.39	203.26
2015 TOTALS (tons/year mitigated)	0.20	1.52	0.96	0.00	6.10	0.07	6.17	1.27	0.06	1.34	203.26
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.20	86.34	0.00	85.74	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	22.99	0.21	23.20	4.80	0.20	5.00	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.55	0.17	0.72	0.11	0.16	0.27	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.55	0.00	0.55	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	22.44	0.04	22.49	4.69	0.04	4.73	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	22.44	0.00	22.44	4.69	0.00	4.69	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	67.45	0.20	67.64	14.09	0.18	14.27	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.12	0.03	0.15	0.02	0.03	0.05	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	67.33	0.12	67.45	14.06	0.11	14.17	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	67.33	0.00	67.33	14.06	0.00	14.06	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	44.63	0.07	44.70	9.32	0.06	9.39	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	44.63	0.07	44.70	9.32	0.06	9.39	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	44.63	0.00	44.63	9.32	0.00	9.32	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Phase Assumptions

Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

Total Acres Disturbed: 1058.29

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

Total Acres Disturbed: 1058.29

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 4330 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 2/3/2014 - 7/31/2014 - Utilities

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.57	4.65	2.68	0.00	3.14	0.21	3.35	0.66	0.20	0.85	523.60
Mass Grading 08/01/2013-01/31/2014	0.46	3.75	2.16	0.00	0.08	0.17	0.25	0.02	0.16	0.17	421.39
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.46	3.75	2.04	0.00	0.00	0.17	0.17	0.00	0.16	0.16	407.43
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.95
Mass Grading 09/02/2013-08/31/2015	0.11	0.90	0.52	0.00	3.07	0.04	3.11	0.64	0.04	0.68	102.21
Mass Grading Dust	0.00	0.00	0.00	0.00	3.07	0.00	3.07	0.64	0.00	0.64	0.00
Mass Grading Off Road Diesel	0.11	0.89	0.48	0.00	0.00	0.04	0.04	0.00	0.04	0.04	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.45

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2014	0.53	4.09	2.49	0.00	9.21	0.20	9.41	1.92	0.18	2.11	502.72
Mass Grading 08/01/2013-01/31/2014	0.09	0.74	0.44	0.00	0.02	0.03	0.05	0.00	0.03	0.03	88.92
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.42	0.00	0.00	0.03	0.03	0.00	0.03	0.03	85.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.95
Mass Grading 09/02/2013-08/31/2015	0.32	2.49	1.50	0.00	9.20	0.12	9.31	1.92	0.11	2.03	306.65
Mass Grading Dust	0.00	0.00	0.00	0.00	9.20	0.00	9.20	1.92	0.00	1.92	0.00
Mass Grading Off Road Diesel	0.31	2.49	1.40	0.00	0.00	0.12	0.12	0.00	0.11	0.11	293.27
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.37
Trenching 02/03/2014-07/31/2014	0.12	0.86	0.55	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.15
Trenching Off Road Diesel	0.12	0.86	0.50	0.00	0.00	0.05	0.05	0.00	0.05	0.05	100.55
Trenching Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.61
2015	0.20	1.52	0.96	0.00	6.10	0.07	6.17	1.27	0.06	1.34	203.26
Mass Grading 09/02/2013-08/31/2015	0.20	1.52	0.96	0.00	6.10	0.07	6.17	1.27	0.06	1.34	203.26
Mass Grading Dust	0.00	0.00	0.00	0.00	6.10	0.00	6.10	1.27	0.00	1.27	0.00
Mass Grading Off Road Diesel	0.20	1.51	0.90	0.00	0.00	0.07	0.07	0.00	0.06	0.06	194.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.86

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2013 - 1/31/2014 - Grading

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/2/2013 - 8/31/2015 - Cut and Fill

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

B.2-4 Roadways

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Greater 2.5 Miles - Programmatic.urb924

Project Name: Roadways Greater 2.5 Miles - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.39	2.93	1.95	0.00	0.77	0.12	0.89	0.16	0.11	0.27	399.83
2014 TOTALS (tons/year mitigated)	0.39	2.93	1.95	0.00	0.12	0.12	0.24	0.02	0.11	0.14	399.83
Percent Reduction	0.00	0.00	0.00	0.00	84.77	0.00	73.13	84.65	0.00	49.81	0.00
2015 TOTALS (tons/year unmitigated)	0.63	4.58	3.31	0.00	1.31	0.20	1.51	0.27	0.19	0.46	679.87
2015 TOTALS (tons/year mitigated)	0.63	4.58	3.31	0.00	0.20	0.20	0.40	0.04	0.19	0.23	679.87
Percent Reduction	0.00	0.00	0.00	0.00	84.76	0.00	73.28	84.63	0.00	50.12	0.00
2016 TOTALS (tons/year unmitigated)	0.51	3.13	2.41	0.00	0.71	0.16	0.87	0.15	0.14	0.29	480.78
2016 TOTALS (tons/year mitigated)	0.51	3.13	2.41	0.00	0.11	0.16	0.27	0.02	0.14	0.17	480.78
Percent Reduction	0.00	0.00	0.00	0.00	84.57	0.00	69.18	84.31	0.00	42.66	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014	0.39	2.93	1.95	0.00	0.77	0.12	0.89	0.16	0.11	0.27	399.83
Mass Grading 06/02/2014-08/29/2014	0.16	1.22	0.75	0.00	0.33	0.05	0.37	0.07	0.04	0.11	160.87
Mass Grading Dust	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.07	0.00	0.07	0.00
Mass Grading Off Road Diesel	0.15	1.21	0.66	0.00	0.00	0.05	0.05	0.00	0.04	0.04	148.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.49
Mass Grading 09/01/2014-08/31/2015	0.23	1.71	1.20	0.00	0.44	0.07	0.52	0.09	0.07	0.16	238.96
Mass Grading Dust	0.00	0.00	0.00	0.00	0.44	0.00	0.44	0.09	0.00	0.09	0.00
Mass Grading Off Road Diesel	0.23	1.71	1.05	0.00	0.00	0.07	0.07	0.00	0.07	0.07	219.80
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.16

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2015	0.63	4.58	3.31	0.00	1.31	0.20	1.51	0.27	0.19	0.46	679.87
Mass Grading 09/01/2014-08/31/2015	0.43	3.13	2.30	0.00	0.87	0.14	1.00	0.18	0.13	0.31	469.79
Mass Grading Dust	0.00	0.00	0.00	0.00	0.87	0.00	0.87	0.18	0.00	0.18	0.00
Mass Grading Off Road Diesel	0.42	3.12	2.04	0.00	0.00	0.14	0.14	0.00	0.13	0.13	432.11
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.68
Mass Grading 09/01/2015-07/15/2016	0.20	1.45	1.02	0.00	0.44	0.07	0.51	0.09	0.06	0.15	210.09
Mass Grading Dust	0.00	0.00	0.00	0.00	0.44	0.00	0.44	0.09	0.00	0.09	0.00
Mass Grading Off Road Diesel	0.20	1.44	0.88	0.00	0.00	0.07	0.07	0.00	0.06	0.06	190.92
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.16
2016	0.51	3.13	2.41	0.00	0.71	0.16	0.87	0.15	0.14	0.29	480.78
Mass Grading 09/01/2015-07/15/2016	0.31	2.18	1.59	0.00	0.71	0.10	0.81	0.15	0.09	0.24	336.62
Mass Grading Dust	0.00	0.00	0.00	0.00	0.71	0.00	0.71	0.15	0.00	0.15	0.00
Mass Grading Off Road Diesel	0.31	2.17	1.39	0.00	0.00	0.10	0.10	0.00	0.09	0.09	305.91
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.71
Asphalt 07/18/2016-11/30/2016	0.20	0.96	0.83	0.00	0.00	0.06	0.06	0.00	0.05	0.05	144.16
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.14	0.88	0.68	0.00	0.00	0.05	0.05	0.00	0.05	0.05	104.40
Paving On Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.93
Paving Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.84

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Phase Assumptions

Phase: Mass Grading 6/2/2014 - 8/29/2014 - Grubbing / Land Clearing

Total Acres Disturbed: 35.07

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

12 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/1/2014 - 8/31/2015 - Grading / Excavation

Total Acres Disturbed: 35.07

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

12 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/1/2015 - 7/15/2016 - Drainage / Utilities / Sub-Grade

Total Acres Disturbed: 35.07

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

12 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 7/18/2016 - 11/30/2016 - Paving

Acres to be Paved: 35.07

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

12 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2014	0.39	2.93	1.95	0.00	0.12	0.12	0.24	0.02	0.11	0.14	399.83
Mass Grading 06/02/2014-08/29/2014	0.16	1.22	0.75	0.00	0.05	0.05	0.10	0.01	0.04	0.05	160.87
Mass Grading Dust	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.15	1.21	0.66	0.00	0.00	0.05	0.05	0.00	0.04	0.04	148.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.49
Mass Grading 09/01/2014-08/31/2015	0.23	1.71	1.20	0.00	0.07	0.07	0.14	0.01	0.07	0.08	238.96
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.23	1.71	1.05	0.00	0.00	0.07	0.07	0.00	0.07	0.07	219.80
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.16
2015	0.63	4.58	3.31	0.00	0.20	0.20	0.40	0.04	0.19	0.23	679.87
Mass Grading 09/01/2014-08/31/2015	0.43	3.13	2.30	0.00	0.13	0.14	0.27	0.03	0.13	0.15	469.79
Mass Grading Dust	0.00	0.00	0.00	0.00	0.13	0.00	0.13	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.42	3.12	2.04	0.00	0.00	0.14	0.14	0.00	0.13	0.13	432.11
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.68
Mass Grading 09/01/2015-07/15/2016	0.20	1.45	1.02	0.00	0.07	0.07	0.13	0.01	0.06	0.08	210.09
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.20	1.44	0.88	0.00	0.00	0.07	0.07	0.00	0.06	0.06	190.92
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.16

2016	0.51	3.13	2.41	0.00	0.11	0.16	0.27	0.02	0.14	0.17	480.78
Mass Grading 09/01/2015-07/15/2016	0.31	2.18	1.59	0.00	0.11	0.10	0.21	0.02	0.09	0.11	336.62
Mass Grading Dust	0.00	0.00	0.00	0.00	0.11	0.00	0.11	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.17	1.39	0.00	0.00	0.10	0.10	0.00	0.09	0.09	305.91
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.71
Asphalt 07/18/2016-11/30/2016	0.20	0.96	0.83	0.00	0.00	0.06	0.06	0.00	0.05	0.05	144.16
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.14	0.88	0.68	0.00	0.00	0.05	0.05	0.00	0.05	0.05	104.40
Paving On Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.93
Paving Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.84

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 6/2/2014 - 8/29/2014 - Grubbing / Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/1/2014 - 8/31/2015 - Grading / Excavation

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/1/2015 - 7/15/2016 - Drainage / Utilities / Sub-Grade

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Greater 2.5 Miles - Mitigated.urb924

Project Name: Roadways Greater 2.5 Miles - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.39	2.93	1.95	0.00	0.77	0.12	0.89	0.16	0.11	0.27	399.83
2014 TOTALS (tons/year mitigated)	0.39	2.93	1.95	0.00	0.11	0.12	0.23	0.02	0.11	0.13	399.83
Percent Reduction	0.00	0.00	0.00	0.00	86.17	0.00	74.33	86.04	0.00	50.63	0.00
2015 TOTALS (tons/year unmitigated)	0.63	4.58	3.31	0.00	1.31	0.20	1.51	0.27	0.19	0.46	679.87
2015 TOTALS (tons/year mitigated)	0.63	4.58	3.31	0.00	0.18	0.20	0.39	0.04	0.19	0.23	679.87
Percent Reduction	0.00	0.00	0.00	0.00	86.16	0.00	74.48	86.02	0.00	50.94	0.00
2016 TOTALS (tons/year unmitigated)	0.51	3.13	2.41	0.00	0.71	0.16	0.87	0.15	0.14	0.29	480.78
2016 TOTALS (tons/year mitigated)	0.51	3.13	2.41	0.00	0.10	0.16	0.26	0.02	0.14	0.17	480.78
Percent Reduction	0.00	0.00	0.00	0.00	85.96	0.00	70.31	85.69	0.00	43.36	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014	0.39	2.93	1.95	0.00	0.77	0.12	0.89	0.16	0.11	0.27	399.83
Mass Grading 06/02/2014-08/29/2014	0.16	1.22	0.75	0.00	0.33	0.05	0.37	0.07	0.04	0.11	160.87
Mass Grading Dust	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.07	0.00	0.07	0.00
Mass Grading Off Road Diesel	0.15	1.21	0.66	0.00	0.00	0.05	0.05	0.00	0.04	0.04	148.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.49
Mass Grading 09/01/2014-08/31/2015	0.23	1.71	1.20	0.00	0.44	0.07	0.52	0.09	0.07	0.16	238.96
Mass Grading Dust	0.00	0.00	0.00	0.00	0.44	0.00	0.44	0.09	0.00	0.09	0.00
Mass Grading Off Road Diesel	0.23	1.71	1.05	0.00	0.00	0.07	0.07	0.00	0.07	0.07	219.80
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.16

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2015	0.63	4.58	3.31	0.00	1.31	0.20	1.51	0.27	0.19	0.46	679.87
Mass Grading 09/01/2014-08/31/2015	0.43	3.13	2.30	0.00	0.87	0.14	1.00	0.18	0.13	0.31	469.79
Mass Grading Dust	0.00	0.00	0.00	0.00	0.87	0.00	0.87	0.18	0.00	0.18	0.00
Mass Grading Off Road Diesel	0.42	3.12	2.04	0.00	0.00	0.14	0.14	0.00	0.13	0.13	432.11
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.68
Mass Grading 09/01/2015-07/15/2016	0.20	1.45	1.02	0.00	0.44	0.07	0.51	0.09	0.06	0.15	210.09
Mass Grading Dust	0.00	0.00	0.00	0.00	0.44	0.00	0.44	0.09	0.00	0.09	0.00
Mass Grading Off Road Diesel	0.20	1.44	0.88	0.00	0.00	0.07	0.07	0.00	0.06	0.06	190.92
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.16
2016	0.51	3.13	2.41	0.00	0.71	0.16	0.87	0.15	0.14	0.29	480.78
Mass Grading 09/01/2015-07/15/2016	0.31	2.18	1.59	0.00	0.71	0.10	0.81	0.15	0.09	0.24	336.62
Mass Grading Dust	0.00	0.00	0.00	0.00	0.71	0.00	0.71	0.15	0.00	0.15	0.00
Mass Grading Off Road Diesel	0.31	2.17	1.39	0.00	0.00	0.10	0.10	0.00	0.09	0.09	305.91
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.71
Asphalt 07/18/2016-11/30/2016	0.20	0.96	0.83	0.00	0.00	0.06	0.06	0.00	0.05	0.05	144.16
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.14	0.88	0.68	0.00	0.00	0.05	0.05	0.00	0.05	0.05	104.40
Paving On Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.93
Paving Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.84

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Phase Assumptions

Phase: Mass Grading 6/2/2014 - 8/29/2014 - Grubbing / Land Clearing

Total Acres Disturbed: 35.07

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

12 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/1/2014 - 8/31/2015 - Grading / Excavation

Total Acres Disturbed: 35.07

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

12 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 9/1/2015 - 7/15/2016 - Drainage / Utilities / Sub-Grade

Total Acres Disturbed: 35.07

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

12 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 7/18/2016 - 11/30/2016 - Paving

Acres to be Paved: 35.07

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

12 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2014	0.39	2.93	1.95	0.00	0.11	0.12	0.23	0.02	0.11	0.13	399.83
Mass Grading 06/02/2014-08/29/2014	0.16	1.22	0.75	0.00	0.05	0.05	0.09	0.01	0.04	0.05	160.87
Mass Grading Dust	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.15	1.21	0.66	0.00	0.00	0.05	0.05	0.00	0.04	0.04	148.39
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.49
Mass Grading 09/01/2014-08/31/2015	0.23	1.71	1.20	0.00	0.06	0.07	0.14	0.01	0.07	0.08	238.96
Mass Grading Dust	0.00	0.00	0.00	0.00	0.06	0.00	0.06	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.23	1.71	1.05	0.00	0.00	0.07	0.07	0.00	0.07	0.07	219.80
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.16
2015	0.63	4.58	3.31	0.00	0.18	0.20	0.39	0.04	0.19	0.23	679.87
Mass Grading 09/01/2014-08/31/2015	0.43	3.13	2.30	0.00	0.12	0.14	0.26	0.03	0.13	0.15	469.79
Mass Grading Dust	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.42	3.12	2.04	0.00	0.00	0.14	0.14	0.00	0.13	0.13	432.11
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.68
Mass Grading 09/01/2015-07/15/2016	0.20	1.45	1.02	0.00	0.06	0.07	0.13	0.01	0.06	0.07	210.09
Mass Grading Dust	0.00	0.00	0.00	0.00	0.06	0.00	0.06	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.20	1.44	0.88	0.00	0.00	0.07	0.07	0.00	0.06	0.06	190.92
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.16

2016	0.51	3.13	2.41	0.00	0.10	0.16	0.26	0.02	0.14	0.17	480.78
Mass Grading 09/01/2015-07/15/2016	0.31	2.18	1.59	0.00	0.10	0.10	0.20	0.02	0.09	0.11	336.62
Mass Grading Dust	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.31	2.17	1.39	0.00	0.00	0.10	0.10	0.00	0.09	0.09	305.91
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.01	0.01	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.71
Asphalt 07/18/2016-11/30/2016	0.20	0.96	0.83	0.00	0.00	0.06	0.06	0.00	0.05	0.05	144.16
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.14	0.88	0.68	0.00	0.00	0.05	0.05	0.00	0.05	0.05	104.40
Paving On Road Diesel	0.01	0.08	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.93
Paving Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.84

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 6/2/2014 - 8/29/2014 - Grubbing / Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/1/2014 - 8/31/2015 - Grading / Excavation

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 9/1/2015 - 7/15/2016 - Drainage / Utilities / Sub-Grade

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Less 2.5 Miles - Programmatic.urb924

Project Name: Roadways Less 2.5 Miles - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2015 TOTALS (tons/year unmitigated)	0.52	3.95	2.55	0.00	1.31	0.17	1.48	0.27	0.16	0.43	569.11
2015 TOTALS (tons/year mitigated)	0.52	3.95	2.55	0.00	0.20	0.17	0.37	0.04	0.16	0.20	569.11
Percent Reduction	0.00	0.00	0.00	0.00	84.85	0.00	74.92	84.79	0.00	53.54	0.00
2016 TOTALS (tons/year unmitigated)	0.42	2.82	1.93	0.00	0.92	0.15	1.07	0.19	0.13	0.33	415.72
2016 TOTALS (tons/year mitigated)	0.42	2.82	1.93	0.00	0.14	0.15	0.29	0.03	0.13	0.16	415.72
Percent Reduction	0.00	0.00	0.00	0.00	84.80	0.00	73.22	84.69	0.00	49.97	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2015	0.52	3.95	2.55	0.00	1.31	0.17	1.48	0.27	0.16	0.43	569.11
Mass Grading 01/01/2015-03/13/2015	0.10	0.77	0.42	0.00	0.26	0.03	0.29	0.05	0.03	0.08	103.37
Mass Grading Dust	0.00	0.00	0.00	0.00	0.26	0.00	0.26	0.05	0.00	0.05	0.00
Mass Grading Off Road Diesel	0.10	0.76	0.39	0.00	0.00	0.03	0.03	0.00	0.03	0.03	98.71
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.66
Mass Grading 03/16/2015-12/31/2015	0.42	3.19	2.14	0.00	1.05	0.14	1.19	0.22	0.13	0.35	465.74
Mass Grading Dust	0.00	0.00	0.00	0.00	1.05	0.00	1.05	0.22	0.00	0.22	0.00
Mass Grading Off Road Diesel	0.42	3.18	1.97	0.00	0.00	0.14	0.14	0.00	0.13	0.13	441.64
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.10
2016	0.42	2.82	1.93	0.00	0.92	0.15	1.07	0.19	0.13	0.33	415.72
Mass Grading 01/01/2016-09/14/2016	0.32	2.32	1.52	0.00	0.92	0.11	1.03	0.19	0.10	0.29	349.64
Mass Grading Dust	0.00	0.00	0.00	0.00	0.92	0.00	0.92	0.19	0.00	0.19	0.00
Mass Grading Off Road Diesel	0.32	2.31	1.39	0.00	0.00	0.11	0.11	0.00	0.10	0.10	328.42
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.22
Asphalt 09/15/2016-12/30/2016	0.09	0.50	0.41	0.00	0.00	0.04	0.04	0.00	0.03	0.03	66.08
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.08	0.47	0.35	0.00	0.00	0.03	0.03	0.00	0.03	0.03	52.41
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.76
Paving Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.91

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Phase Assumptions

Phase: Mass Grading 1/1/2015 - 3/13/2015 - Grubbing / Land Clearing

Total Acres Disturbed: 11.33

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

4 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 3/16/2015 - 12/31/2015 - Grading / Excavation

Total Acres Disturbed: 11.33

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

4 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/1/2016 - 9/14/2016 - Drainage / Utilities / Sub-Grade

Total Acres Disturbed: 11.33

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

4 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 9/15/2016 - 12/30/2016 - Paving

Acres to be Paved: 11.33

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

4 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2015	0.52	3.95	2.55	0.00	0.20	0.17	0.37	0.04	0.16	0.20	569.11
Mass Grading 01/01/2015-03/13/2015	0.10	0.77	0.42	0.00	0.04	0.03	0.07	0.01	0.03	0.04	103.37
Mass Grading Dust	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.10	0.76	0.39	0.00	0.00	0.03	0.03	0.00	0.03	0.03	98.71
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.66
Mass Grading 03/16/2015-12/31/2015	0.42	3.19	2.14	0.00	0.16	0.14	0.30	0.03	0.13	0.17	465.74
Mass Grading Dust	0.00	0.00	0.00	0.00	0.16	0.00	0.16	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.42	3.18	1.97	0.00	0.00	0.14	0.14	0.00	0.13	0.13	441.64
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.10
2016	0.42	2.82	1.93	0.00	0.14	0.15	0.29	0.03	0.13	0.16	415.72
Mass Grading 01/01/2016-09/14/2016	0.32	2.32	1.52	0.00	0.14	0.11	0.25	0.03	0.10	0.13	349.64
Mass Grading Dust	0.00	0.00	0.00	0.00	0.14	0.00	0.14	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.32	2.31	1.39	0.00	0.00	0.11	0.11	0.00	0.10	0.10	328.42
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.22
Asphalt 09/15/2016-12/30/2016	0.09	0.50	0.41	0.00	0.00	0.04	0.04	0.00	0.03	0.03	66.08
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.08	0.47	0.35	0.00	0.00	0.03	0.03	0.00	0.03	0.03	52.41
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.76
Paving Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.91

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Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2015 - 3/13/2015 - Grubbing / Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 3/16/2015 - 12/31/2015 - Grading / Excavation

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 1/1/2016 - 9/14/2016 - Drainage / Utilities / Sub-Grade

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

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PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Less 2.5 Miles - Mitigated.urb924

Project Name: Roadways Less 2.5 Miles - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2015 TOTALS (tons/year unmitigated)	0.52	3.95	2.55	0.00	1.31	0.17	1.48	0.27	0.16	0.43	569.11
2015 TOTALS (tons/year mitigated)	0.52	3.95	2.55	0.00	0.18	0.17	0.35	0.04	0.16	0.20	569.11
Percent Reduction	0.00	0.00	0.00	0.00	86.25	0.00	76.15	86.18	0.00	54.42	0.00
2016 TOTALS (tons/year unmitigated)	0.42	2.82	1.93	0.00	0.92	0.15	1.07	0.19	0.13	0.33	415.72
2016 TOTALS (tons/year mitigated)	0.42	2.82	1.93	0.00	0.13	0.15	0.27	0.03	0.13	0.16	415.72
Percent Reduction	0.00	0.00	0.00	0.00	86.19	0.00	74.43	86.08	0.00	50.79	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2015	0.52	3.95	2.55	0.00	1.31	0.17	1.48	0.27	0.16	0.43	569.11
Mass Grading 01/01/2015-03/13/2015	0.10	0.77	0.42	0.00	0.26	0.03	0.29	0.05	0.03	0.08	103.37
Mass Grading Dust	0.00	0.00	0.00	0.00	0.26	0.00	0.26	0.05	0.00	0.05	0.00
Mass Grading Off Road Diesel	0.10	0.76	0.39	0.00	0.00	0.03	0.03	0.00	0.03	0.03	98.71
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.66
Mass Grading 03/16/2015-12/31/2015	0.42	3.19	2.14	0.00	1.05	0.14	1.19	0.22	0.13	0.35	465.74
Mass Grading Dust	0.00	0.00	0.00	0.00	1.05	0.00	1.05	0.22	0.00	0.22	0.00
Mass Grading Off Road Diesel	0.42	3.18	1.97	0.00	0.00	0.14	0.14	0.00	0.13	0.13	441.64
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.10
2016	0.42	2.82	1.93	0.00	0.92	0.15	1.07	0.19	0.13	0.33	415.72
Mass Grading 01/01/2016-09/14/2016	0.32	2.32	1.52	0.00	0.92	0.11	1.03	0.19	0.10	0.29	349.64
Mass Grading Dust	0.00	0.00	0.00	0.00	0.92	0.00	0.92	0.19	0.00	0.19	0.00
Mass Grading Off Road Diesel	0.32	2.31	1.39	0.00	0.00	0.11	0.11	0.00	0.10	0.10	328.42
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.22
Asphalt 09/15/2016-12/30/2016	0.09	0.50	0.41	0.00	0.00	0.04	0.04	0.00	0.03	0.03	66.08
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.08	0.47	0.35	0.00	0.00	0.03	0.03	0.00	0.03	0.03	52.41
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.76
Paving Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.91

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Phase Assumptions

Phase: Mass Grading 1/1/2015 - 3/13/2015 - Grubbing / Land Clearing

Total Acres Disturbed: 11.33

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

4 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 3/16/2015 - 12/31/2015 - Grading / Excavation

Total Acres Disturbed: 11.33

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

4 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 1/1/2016 - 9/14/2016 - Drainage / Utilities / Sub-Grade

Total Acres Disturbed: 11.33

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

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4 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 9/15/2016 - 12/30/2016 - Paving

Acres to be Paved: 11.33

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

4 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

4/11/2011 11:36:35 AM

2015	0.52	3.95	2.55	0.00	0.18	0.17	0.35	0.04	0.16	0.20	569.11
Mass Grading 01/01/2015-03/13/2015	0.10	0.77	0.42	0.00	0.04	0.03	0.07	0.01	0.03	0.03	103.37
Mass Grading Dust	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.10	0.76	0.39	0.00	0.00	0.03	0.03	0.00	0.03	0.03	98.71
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.66
Mass Grading 03/16/2015-12/31/2015	0.42	3.19	2.14	0.00	0.14	0.14	0.29	0.03	0.13	0.16	465.74
Mass Grading Dust	0.00	0.00	0.00	0.00	0.14	0.00	0.14	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.42	3.18	1.97	0.00	0.00	0.14	0.14	0.00	0.13	0.13	441.64
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.10
2016	0.42	2.82	1.93	0.00	0.13	0.15	0.27	0.03	0.13	0.16	415.72
Mass Grading 01/01/2016-09/14/2016	0.32	2.32	1.52	0.00	0.13	0.11	0.24	0.03	0.10	0.13	349.64
Mass Grading Dust	0.00	0.00	0.00	0.00	0.13	0.00	0.13	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.32	2.31	1.39	0.00	0.00	0.11	0.11	0.00	0.10	0.10	328.42
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.01	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.22
Asphalt 09/15/2016-12/30/2016	0.09	0.50	0.41	0.00	0.00	0.04	0.04	0.00	0.03	0.03	66.08
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.08	0.47	0.35	0.00	0.00	0.03	0.03	0.00	0.03	0.03	52.41
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.76
Paving Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.91

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Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2015 - 3/13/2015 - Grubbing / Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 3/16/2015 - 12/31/2015 - Grading / Excavation

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 1/1/2016 - 9/14/2016 - Drainage / Utilities / Sub-Grade

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

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PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

4/11/2011 11:27:51 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Less 1 Mile - Programmatic.urb924

Project Name: Roadways Less 1 Mile - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017 TOTALS (tons/year unmitigated)	0.38	2.68	1.85	0.00	1.11	0.13	1.24	0.23	0.12	0.35	441.24
2017 TOTALS (tons/year mitigated)	0.38	2.68	1.85	0.00	0.17	0.13	0.30	0.04	0.12	0.15	441.24
Percent Reduction	0.00	0.00	0.00	0.00	84.87	0.00	76.12	84.82	0.00	56.32	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017	0.38	2.68	1.85	0.00	1.11	0.13	1.24	0.23	0.12	0.35	441.24

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Mass Grading 01/02/2017-02/07/2017	0.04	0.32	0.17	0.00	0.14	0.01	0.15	0.03	0.01	0.04	48.74
Mass Grading Dust	0.00	0.00	0.00	0.00	0.14	0.00	0.14	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.04	0.31	0.16	0.00	0.00	0.01	0.01	0.00	0.01	0.01	47.36
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38
Mass Grading 02/08/2017-06/30/2017	0.17	1.20	0.89	0.00	0.52	0.05	0.57	0.11	0.05	0.16	210.71
Mass Grading Dust	0.00	0.00	0.00	0.00	0.52	0.00	0.52	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.17	1.20	0.85	0.00	0.00	0.05	0.05	0.00	0.05	0.05	202.79
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.92
Mass Grading 07/03/2017-11/07/2017	0.14	0.97	0.64	0.00	0.46	0.05	0.51	0.10	0.04	0.14	158.02
Mass Grading Dust	0.00	0.00	0.00	0.00	0.46	0.00	0.46	0.10	0.00	0.10	0.00
Mass Grading Off Road Diesel	0.14	0.97	0.60	0.00	0.00	0.05	0.05	0.00	0.04	0.04	150.94
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.07
Asphalt 11/08/2017-12/29/2017	0.03	0.19	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	23.77
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.18	0.14	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.38
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95

Phase Assumptions

Phase: Mass Grading 1/2/2017 - 2/7/2017 - Grubbing / Land Clearing

Total Acres Disturbed: 2.41

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 2/8/2017 - 6/30/2017 - Grading / Excavation

Total Acres Disturbed: 2.41

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 7/3/2017 - 11/7/2017 - Drainage / Utilities / Subgrade

Total Acres Disturbed: 2.41

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

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Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 11/8/2017 - 12/29/2017 - Paving

Acres to be Paved: 2.41

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2017	0.38	2.68	1.85	0.00	0.17	0.13	0.30	0.04	0.12	0.15	441.24
Mass Grading 01/02/2017-02/07/2017	0.04	0.32	0.17	0.00	0.02	0.01	0.03	0.00	0.01	0.02	48.74
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.04	0.31	0.16	0.00	0.00	0.01	0.01	0.00	0.01	0.01	47.36
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38
Mass Grading 02/08/2017-06/30/2017	0.17	1.20	0.89	0.00	0.08	0.05	0.13	0.02	0.05	0.07	210.71
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.17	1.20	0.85	0.00	0.00	0.05	0.05	0.00	0.05	0.05	202.79
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.92
Mass Grading 07/03/2017-11/07/2017	0.14	0.97	0.64	0.00	0.07	0.05	0.12	0.01	0.04	0.06	158.02
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.14	0.97	0.60	0.00	0.00	0.05	0.05	0.00	0.04	0.04	150.94
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.07
Asphalt 11/08/2017-12/29/2017	0.03	0.19	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	23.77
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.18	0.14	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.38
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95

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Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/2/2017 - 2/7/2017 - Grubbing / Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 2/8/2017 - 6/30/2017 - Grading / Excavation

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 7/3/2017 - 11/7/2017 - Drainage / Utilities / Subgrade

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

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PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Less 1 Mile - Mitigated.urb924

Project Name: Roadways Less 1 Mile - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017 TOTALS (tons/year unmitigated)	0.38	2.68	1.85	0.00	1.11	0.13	1.24	0.23	0.12	0.35	441.24
2017 TOTALS (tons/year mitigated)	0.38	2.68	1.85	0.00	0.15	0.13	0.28	0.03	0.12	0.15	441.24
Percent Reduction	0.00	0.00	0.00	0.00	86.27	0.00	77.37	86.21	0.00	57.25	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017	0.38	2.68	1.85	0.00	1.11	0.13	1.24	0.23	0.12	0.35	441.24

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Mass Grading 01/02/2017-02/07/2017	0.04	0.32	0.17	0.00	0.14	0.01	0.15	0.03	0.01	0.04	48.74
Mass Grading Dust	0.00	0.00	0.00	0.00	0.14	0.00	0.14	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.04	0.31	0.16	0.00	0.00	0.01	0.01	0.00	0.01	0.01	47.36
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38
Mass Grading 02/08/2017-06/30/2017	0.17	1.20	0.89	0.00	0.52	0.05	0.57	0.11	0.05	0.16	210.71
Mass Grading Dust	0.00	0.00	0.00	0.00	0.52	0.00	0.52	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.17	1.20	0.85	0.00	0.00	0.05	0.05	0.00	0.05	0.05	202.79
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.92
Mass Grading 07/03/2017-11/07/2017	0.14	0.97	0.64	0.00	0.46	0.05	0.51	0.10	0.04	0.14	158.02
Mass Grading Dust	0.00	0.00	0.00	0.00	0.46	0.00	0.46	0.10	0.00	0.10	0.00
Mass Grading Off Road Diesel	0.14	0.97	0.60	0.00	0.00	0.05	0.05	0.00	0.04	0.04	150.94
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.07
Asphalt 11/08/2017-12/29/2017	0.03	0.19	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	23.77
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.18	0.14	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.38
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95

Phase Assumptions

Phase: Mass Grading 1/2/2017 - 2/7/2017 - Grubbing / Land Clearing

Total Acres Disturbed: 2.41

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Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 2/8/2017 - 6/30/2017 - Grading / Excavation

Total Acres Disturbed: 2.41

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 7/3/2017 - 11/7/2017 - Drainage / Utilities / Subgrade

Total Acres Disturbed: 2.41

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

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Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 11/8/2017 - 12/29/2017 - Paving

Acres to be Paved: 2.41

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Signal Boards (15 hp) operating at a 0.78 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

4/11/2011 11:30:34 AM

2017	0.38	2.68	1.85	0.00	0.15	0.13	0.28	0.03	0.12	0.15	441.24
Mass Grading 01/02/2017-02/07/2017	0.04	0.32	0.17	0.00	0.02	0.01	0.03	0.00	0.01	0.02	48.74
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.04	0.31	0.16	0.00	0.00	0.01	0.01	0.00	0.01	0.01	47.36
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38
Mass Grading 02/08/2017-06/30/2017	0.17	1.20	0.89	0.00	0.07	0.05	0.12	0.01	0.05	0.06	210.71
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.17	1.20	0.85	0.00	0.00	0.05	0.05	0.00	0.05	0.05	202.79
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.92
Mass Grading 07/03/2017-11/07/2017	0.14	0.97	0.64	0.00	0.06	0.05	0.11	0.01	0.04	0.06	158.02
Mass Grading Dust	0.00	0.00	0.00	0.00	0.06	0.00	0.06	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.14	0.97	0.60	0.00	0.00	0.05	0.05	0.00	0.04	0.04	150.94
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.07
Asphalt 11/08/2017-12/29/2017	0.03	0.19	0.15	0.00	0.00	0.01	0.01	0.00	0.01	0.01	23.77
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.18	0.14	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.38
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95

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Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/2/2017 - 2/7/2017 - Grubbing / Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 2/8/2017 - 6/30/2017 - Grading / Excavation

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 7/3/2017 - 11/7/2017 - Drainage / Utilities / Subgrade

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

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PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Structures - Programmatic.urb924

Project Name: Structures Roadways - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.33	2.73	1.43	0.00	0.76	0.12	0.88	0.16	0.11	0.27	328.00
2013 TOTALS (tons/year mitigated)	0.33	2.73	1.43	0.00	0.11	0.12	0.24	0.02	0.11	0.14	328.00
Percent Reduction	0.00	0.00	0.00	0.00	84.89	0.00	73.23	84.85	0.00	49.89	0.00
2014 TOTALS (tons/year unmitigated)	0.15	1.14	0.65	0.00	0.35	0.06	0.41	0.07	0.06	0.13	136.34
2014 TOTALS (tons/year mitigated)	0.15	1.14	0.65	0.00	0.05	0.06	0.12	0.01	0.06	0.07	136.34
Percent Reduction	0.00	0.00	0.00	0.00	84.87	0.00	72.01	84.82	0.00	47.49	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.33	2.73	1.43	0.00	0.76	0.12	0.88	0.16	0.11	0.27	328.00
Mass Grading 06/03/2013-07/08/2013	0.05	0.41	0.19	0.00	0.13	0.02	0.15	0.03	0.01	0.04	45.35
Mass Grading Dust	0.00	0.00	0.00	0.00	0.13	0.00	0.13	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.05	0.40	0.18	0.00	0.00	0.02	0.02	0.00	0.01	0.01	44.35
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Mass Grading 07/09/2013-11/29/2013	0.24	2.01	1.08	0.00	0.52	0.09	0.61	0.11	0.08	0.19	246.20
Mass Grading Dust	0.00	0.00	0.00	0.00	0.52	0.00	0.52	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.24	2.01	1.01	0.00	0.00	0.09	0.09	0.00	0.08	0.08	238.21
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.99
Mass Grading 12/02/2013-04/08/2014	0.04	0.31	0.16	0.00	0.11	0.02	0.13	0.02	0.01	0.04	36.45
Mass Grading Dust	0.00	0.00	0.00	0.00	0.11	0.00	0.11	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.04	0.31	0.15	0.00	0.00	0.02	0.02	0.00	0.01	0.01	35.04
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41

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2014	0.15	1.14	0.65	0.00	0.35	0.06	0.41	0.07	0.06	0.13	136.34
Mass Grading 12/02/2013-04/08/2014	0.12	0.93	0.50	0.00	0.35	0.04	0.40	0.07	0.04	0.11	115.96
Mass Grading Dust	0.00	0.00	0.00	0.00	0.35	0.00	0.35	0.07	0.00	0.07	0.00
Mass Grading Off Road Diesel	0.12	0.93	0.47	0.00	0.00	0.04	0.04	0.00	0.04	0.04	111.48
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.48
Asphalt 04/09/2014-05/30/2014	0.03	0.21	0.14	0.00	0.00	0.02	0.02	0.00	0.02	0.02	20.38
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.20	0.13	0.00	0.00	0.02	0.02	0.00	0.02	0.02	18.56
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46

Phase Assumptions

Phase: Mass Grading 6/3/2013 - 7/8/2013 - Grubbing / Land Clearing

Total Acres Disturbed: 0.6

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 7/9/2013 - 11/29/2013 - Grading / Excavation

Total Acres Disturbed: 0.6

Maximum Daily Acreage Disturbed: 0.5

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Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 12/2/2013 - 4/8/2014 - Drainage / Utilities / Sub-Grade

Total Acres Disturbed: 0.6

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 4/9/2014 - 5/30/2014 - Paving

Acres to be Paved: 0.6

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.33	2.73	1.43	0.00	0.11	0.12	0.24	0.02	0.11	0.14	328.00
Mass Grading 06/03/2013-07/08/2013	0.05	0.41	0.19	0.00	0.02	0.02	0.04	0.00	0.01	0.02	45.35
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.05	0.40	0.18	0.00	0.00	0.02	0.02	0.00	0.01	0.01	44.35
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Mass Grading 07/09/2013-11/29/2013	0.24	2.01	1.08	0.00	0.08	0.09	0.17	0.02	0.08	0.10	246.20
Mass Grading Dust	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.24	2.01	1.01	0.00	0.00	0.09	0.09	0.00	0.08	0.08	238.21
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.99
Mass Grading 12/02/2013-04/08/2014	0.04	0.31	0.16	0.00	0.02	0.02	0.03	0.00	0.01	0.02	36.45
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.04	0.31	0.15	0.00	0.00	0.02	0.02	0.00	0.01	0.01	35.04
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41

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2014	0.15	1.14	0.65	0.00	0.05	0.06	0.12	0.01	0.06	0.07	136.34
Mass Grading 12/02/2013-04/08/2014	0.12	0.93	0.50	0.00	0.05	0.04	0.10	0.01	0.04	0.05	115.96
Mass Grading Dust	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.12	0.93	0.47	0.00	0.00	0.04	0.04	0.00	0.04	0.04	111.48
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.48
Asphalt 04/09/2014-05/30/2014	0.03	0.21	0.14	0.00	0.00	0.02	0.02	0.00	0.02	0.02	20.38
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.20	0.13	0.00	0.00	0.02	0.02	0.00	0.02	0.02	18.56
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 6/3/2013 - 7/8/2013 - Grubbing / Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 7/9/2013 - 11/29/2013 - Grading / Excavation

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 12/2/2013 - 4/8/2014 - Drainage / Utilities / Sub-Grade

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Structures - Mitigated.urb924

Project Name: Structures Roadways - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.33	2.73	1.43	0.00	0.76	0.12	0.88	0.16	0.11	0.27	328.00
2013 TOTALS (tons/year mitigated)	0.33	2.73	1.43	0.00	0.10	0.12	0.23	0.02	0.11	0.13	328.00
Percent Reduction	0.00	0.00	0.00	0.00	86.28	0.00	74.43	86.24	0.00	50.71	0.00
2014 TOTALS (tons/year unmitigated)	0.15	1.14	0.65	0.00	0.35	0.06	0.41	0.07	0.06	0.13	136.34
2014 TOTALS (tons/year mitigated)	0.15	1.14	0.65	0.00	0.05	0.06	0.11	0.01	0.06	0.07	136.34
Percent Reduction	0.00	0.00	0.00	0.00	86.27	0.00	73.19	86.21	0.00	48.27	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2013	0.33	2.73	1.43	0.00	0.76	0.12	0.88	0.16	0.11	0.27	328.00
Mass Grading 06/03/2013-07/08/2013	0.05	0.41	0.19	0.00	0.13	0.02	0.15	0.03	0.01	0.04	45.35
Mass Grading Dust	0.00	0.00	0.00	0.00	0.13	0.00	0.13	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.05	0.40	0.18	0.00	0.00	0.02	0.02	0.00	0.01	0.01	44.35
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Mass Grading 07/09/2013-11/29/2013	0.24	2.01	1.08	0.00	0.52	0.09	0.61	0.11	0.08	0.19	246.20
Mass Grading Dust	0.00	0.00	0.00	0.00	0.52	0.00	0.52	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.24	2.01	1.01	0.00	0.00	0.09	0.09	0.00	0.08	0.08	238.21
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.99
Mass Grading 12/02/2013-04/08/2014	0.04	0.31	0.16	0.00	0.11	0.02	0.13	0.02	0.01	0.04	36.45
Mass Grading Dust	0.00	0.00	0.00	0.00	0.11	0.00	0.11	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.04	0.31	0.15	0.00	0.00	0.02	0.02	0.00	0.01	0.01	35.04
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41

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2014	0.15	1.14	0.65	0.00	0.35	0.06	0.41	0.07	0.06	0.13	136.34
Mass Grading 12/02/2013-04/08/2014	0.12	0.93	0.50	0.00	0.35	0.04	0.40	0.07	0.04	0.11	115.96
Mass Grading Dust	0.00	0.00	0.00	0.00	0.35	0.00	0.35	0.07	0.00	0.07	0.00
Mass Grading Off Road Diesel	0.12	0.93	0.47	0.00	0.00	0.04	0.04	0.00	0.04	0.04	111.48
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.48
Asphalt 04/09/2014-05/30/2014	0.03	0.21	0.14	0.00	0.00	0.02	0.02	0.00	0.02	0.02	20.38
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.20	0.13	0.00	0.00	0.02	0.02	0.00	0.02	0.02	18.56
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46

Phase Assumptions

Phase: Mass Grading 6/3/2013 - 7/8/2013 - Grubbing / Land Clearing

Total Acres Disturbed: 0.6

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 7/9/2013 - 11/29/2013 - Grading / Excavation

Total Acres Disturbed: 0.6

Maximum Daily Acreage Disturbed: 0.5

4/11/2011 11:24:13 AM

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Mass Grading 12/2/2013 - 4/8/2014 - Drainage / Utilities / Sub-Grade

Total Acres Disturbed: 0.6

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 4/9/2014 - 5/30/2014 - Paving

Acres to be Paved: 0.6

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.33	2.73	1.43	0.00	0.10	0.12	0.23	0.02	0.11	0.13	328.00
Mass Grading 06/03/2013-07/08/2013	0.05	0.41	0.19	0.00	0.02	0.02	0.03	0.00	0.01	0.02	45.35
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.05	0.40	0.18	0.00	0.00	0.02	0.02	0.00	0.01	0.01	44.35
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Mass Grading 07/09/2013-11/29/2013	0.24	2.01	1.08	0.00	0.07	0.09	0.16	0.01	0.08	0.10	246.20
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.24	2.01	1.01	0.00	0.00	0.09	0.09	0.00	0.08	0.08	238.21
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.99
Mass Grading 12/02/2013-04/08/2014	0.04	0.31	0.16	0.00	0.02	0.02	0.03	0.00	0.01	0.02	36.45
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.04	0.31	0.15	0.00	0.00	0.02	0.02	0.00	0.01	0.01	35.04
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41

2014	0.15	1.14	0.65	0.00	0.05	0.06	0.11	0.01	0.06	0.07	136.34
Mass Grading 12/02/2013-04/08/2014	0.12	0.93	0.50	0.00	0.05	0.04	0.09	0.01	0.04	0.05	115.96
Mass Grading Dust	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.12	0.93	0.47	0.00	0.00	0.04	0.04	0.00	0.04	0.04	111.48
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.48
Asphalt 04/09/2014-05/30/2014	0.03	0.21	0.14	0.00	0.00	0.02	0.02	0.00	0.02	0.02	20.38
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.03	0.20	0.13	0.00	0.00	0.02	0.02	0.00	0.02	0.02	18.56
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 6/3/2013 - 7/8/2013 - Grubbing / Land Clearing

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 7/9/2013 - 11/29/2013 - Grading / Excavation

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

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For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 12/2/2013 - 4/8/2014 - Drainage / Utilities / Sub-Grade

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

B.2-5 Elevated Structures

3/29/2011 8:39:14 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Elevated Structures.urb924

Project Name: Elevated Structures

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.74	5.89	3.92	0.00	0.01	0.26	0.27	0.00	0.24	0.24	947.50

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2014	0.74	5.89	3.92	0.00	0.01	0.26	0.27	0.00	0.24	0.24	947.50
Building 01/01/2014-03/31/2014	0.29	2.36	1.43	0.00	0.00	0.11	0.11	0.00	0.10	0.10	359.28
Building Off Road Diesel	0.28	2.35	1.18	0.00	0.00	0.10	0.10	0.00	0.10	0.10	326.23
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.05
Building 04/01/2014-06/30/2014	0.07	0.54	0.51	0.00	0.00	0.02	0.03	0.00	0.02	0.02	108.03
Building Off Road Diesel	0.07	0.53	0.25	0.00	0.00	0.02	0.02	0.00	0.02	0.02	74.47
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.56
Building 07/01/2014-09/30/2014	0.30	2.44	1.48	0.00	0.00	0.11	0.11	0.00	0.10	0.10	370.50
Building Off Road Diesel	0.29	2.42	1.22	0.00	0.00	0.11	0.11	0.00	0.10	0.10	336.42
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.08
Building 10/01/2014-12/31/2014	0.08	0.55	0.51	0.00	0.00	0.02	0.03	0.00	0.02	0.02	109.69
Building Off Road Diesel	0.07	0.54	0.25	0.00	0.00	0.02	0.02	0.00	0.02	0.02	75.61
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.08

Phase Assumptions

Phase: Building Construction 1/1/2014 - 3/31/2014 - Quarter 1 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8.6 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 1.1 hours per day

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 6.9 hours per day

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1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 2.3 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 11.4 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 11.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 11.4 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Pumps (600 hp) operating at a 0.74 load factor for 5.7 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 5.7 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 5.7 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 5.7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 11.4 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

Phase: Building Construction 4/1/2014 - 6/30/2014 - Quarter 2 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 2.9 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 1.1 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 7.1 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

3/29/2011 8:39:14 PM

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

Phase: Building Construction 7/1/2014 - 9/30/2014 - Quarter 1 Construction Repeated

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8.6 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 1.1 hours per day

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 6.9 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 2.3 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 11.4 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 11.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 11.4 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Pumps (600 hp) operating at a 0.74 load factor for 5.7 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 5.7 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 5.7 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 5.7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 11.4 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

Phase: Building Construction 10/1/2014 - 12/31/2014 - Quarter 2 Construction Repeated

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 2.9 hours per day

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1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 1.1 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 7.1 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

B.2-6 Laying Track

3/29/2011 8:14:51 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\At-Grade Alignment.urb924

Project Name: At-Grade Alignment

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.77	6.21	3.94	0.00	0.01	0.28	0.29	0.00	0.26	0.26	968.76

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2014	0.77	6.21	3.94	0.00	0.01	0.28	0.29	0.00	0.26	0.26	968.76
Building 01/01/2014-03/31/2014	0.19	1.54	0.98	0.00	0.00	0.07	0.07	0.00	0.06	0.06	239.35
Building Off Road Diesel	0.18	1.52	0.72	0.00	0.00	0.07	0.07	0.00	0.06	0.06	206.30
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.05
Building 04/01/2014-06/30/2014	0.19	1.52	0.97	0.00	0.00	0.07	0.07	0.00	0.06	0.06	236.32
Building Off Road Diesel	0.18	1.50	0.71	0.00	0.00	0.07	0.07	0.00	0.06	0.06	202.76
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.56
Building 07/01/2014-09/30/2014	0.20	1.59	1.00	0.00	0.00	0.07	0.07	0.00	0.07	0.07	248.68
Building Off Road Diesel	0.19	1.58	0.74	0.00	0.00	0.07	0.07	0.00	0.06	0.06	214.60
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.08
Building 10/01/2014-12/31/2014	0.19	1.56	0.99	0.00	0.00	0.07	0.07	0.00	0.06	0.06	244.41
Building Off Road Diesel	0.19	1.55	0.73	0.00	0.00	0.07	0.07	0.00	0.06	0.06	210.33
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.08

Phase Assumptions

Phase: Building Construction 1/1/2014 - 3/31/2014 - Quarter 1 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 4.6 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

3/29/2011 8:14:51 PM

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 4/1/2014 - 6/30/2014 - Quarter 2 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 1.4 hours per day

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1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (191 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 7/1/2014 - 9/30/2014 - Quarter 3 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 1.4 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 10/1/2014 - 12/31/2014 - Quarter 4 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

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1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Elevated Alignment.urb924

Project Name: Elevated Alignment

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.44	3.28	2.53	0.00	0.01	0.15	0.16	0.00	0.14	0.14	580.85

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2014	0.44	3.28	2.53	0.00	0.01	0.15	0.16	0.00	0.14	0.14	580.85
Building 01/01/2014-03/31/2014	0.10	0.79	0.59	0.00	0.00	0.03	0.04	0.00	0.03	0.03	143.51
Building Off Road Diesel	0.09	0.78	0.34	0.00	0.00	0.03	0.03	0.00	0.03	0.03	110.46
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.05
Building 04/01/2014-06/30/2014	0.11	0.83	0.66	0.00	0.00	0.04	0.04	0.00	0.04	0.04	143.57
Building Off Road Diesel	0.11	0.81	0.41	0.00	0.00	0.04	0.04	0.00	0.04	0.04	110.01
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.56
Building 07/01/2014-09/30/2014	0.11	0.82	0.61	0.00	0.00	0.03	0.04	0.00	0.03	0.03	147.99
Building Off Road Diesel	0.10	0.81	0.35	0.00	0.00	0.03	0.03	0.00	0.03	0.03	113.91
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.08
Building 10/01/2014-12/31/2014	0.11	0.84	0.67	0.00	0.00	0.04	0.04	0.00	0.04	0.04	145.78
Building Off Road Diesel	0.11	0.82	0.42	0.00	0.00	0.04	0.04	0.00	0.04	0.04	111.70
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.08

Phase Assumptions

Phase: Building Construction 1/1/2014 - 3/31/2014 - Quarter 3 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 5.7 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 4.6 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 7.1 hours per day

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1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

Phase: Building Construction 4/1/2014 - 6/30/2014 - Quarter 4 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 5.7 hours per day

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Phase: Building Construction 7/1/2014 - 9/30/2014 - Quarter 3 Construction

Off-Road Equipment:

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Phase: Building Construction 10/1/2014 - 12/31/2014 - Quarter 4 Construction

Off-Road Equipment:

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B.2-7 Merced Train Station

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Merced Station - Construction - Programmatic.urb924

Project Name: Merced Station - Construction - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.11	0.85	0.53	0.00	3.52	0.04	3.57	0.74	0.04	0.77	103.47
2014 TOTALS (tons/year mitigated)	0.11	0.85	0.53	0.00	0.53	0.04	0.57	0.11	0.04	0.15	103.47
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	83.94	84.94	0.00	80.72	0.00
2015 TOTALS (tons/year unmitigated)	0.53	3.77	4.65	0.01	6.92	0.19	7.10	1.45	0.17	1.62	994.15
2015 TOTALS (tons/year mitigated)	0.53	3.77	4.65	0.01	1.07	0.19	1.25	0.23	0.17	0.40	994.15
Percent Reduction	0.00	0.00	0.00	0.00	84.59	0.00	82.39	84.36	0.00	75.54	0.00
2016 TOTALS (tons/year unmitigated)	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
2016 TOTALS (tons/year mitigated)	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017 TOTALS (tons/year unmitigated)	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11

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2017 TOTALS (tons/year mitigated)	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
2018 TOTALS (tons/year mitigated)	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019 TOTALS (tons/year unmitigated)	5.06	0.48	0.92	0.00	0.01	0.02	0.03	0.00	0.02	0.02	264.01
2019 TOTALS (tons/year mitigated)	5.06	0.48	0.92	0.00	0.01	0.02	0.03	0.00	0.02	0.02	264.01
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014	0.11	0.85	0.53	0.00	3.52	0.04	3.57	0.74	0.04	0.77	103.47
Mass Grading 10/01/2014-06/30/2015	0.11	0.85	0.53	0.00	3.52	0.04	3.57	0.74	0.04	0.77	103.47
Mass Grading Dust	0.00	0.00	0.00	0.00	3.52	0.00	3.52	0.74	0.00	0.74	0.00
Mass Grading Off Road Diesel	0.11	0.85	0.50	0.00	0.00	0.04	0.04	0.00	0.04	0.04	99.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.23

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2015	0.53	3.77	4.65	0.01	6.92	0.19	7.10	1.45	0.17	1.62	994.15
Mass Grading 10/01/2014-06/30/2015	0.20	1.53	1.01	0.00	6.89	0.07	6.96	1.44	0.07	1.51	202.25
Mass Grading Dust	0.00	0.00	0.00	0.00	6.89	0.00	6.89	1.44	0.00	1.44	0.00
Mass Grading Off Road Diesel	0.20	1.53	0.95	0.00	0.00	0.07	0.07	0.00	0.07	0.07	193.98
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.26
Building 07/01/2015-02/28/2019	0.33	2.24	3.65	0.01	0.03	0.11	0.14	0.01	0.10	0.11	791.90
Building Off Road Diesel	0.16	0.79	0.64	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.00
Building Vendor Trips	0.12	1.35	1.19	0.00	0.02	0.05	0.07	0.01	0.05	0.05	420.36
Building Worker Trips	0.05	0.09	1.82	0.00	0.01	0.01	0.02	0.00	0.01	0.01	264.54
2016	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Building 07/01/2015-02/28/2019	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Building Off Road Diesel	0.29	1.46	1.23	0.00	0.00	0.09	0.09	0.00	0.08	0.08	211.57
Building Vendor Trips	0.22	2.35	2.17	0.01	0.03	0.09	0.12	0.01	0.08	0.09	831.24
Building Worker Trips	0.10	0.17	3.29	0.01	0.03	0.01	0.04	0.01	0.01	0.02	523.17
2017	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Building 07/01/2015-02/28/2019	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Building Off Road Diesel	0.26	1.35	1.20	0.00	0.00	0.08	0.08	0.00	0.07	0.07	210.76
Building Vendor Trips	0.20	2.06	1.99	0.01	0.03	0.08	0.11	0.01	0.07	0.08	828.12
Building Worker Trips	0.09	0.15	3.00	0.01	0.03	0.01	0.04	0.01	0.01	0.02	521.24

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2018	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Building 07/01/2015-02/28/2019	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Building Off Road Diesel	0.23	1.26	1.18	0.00	0.00	0.07	0.07	0.00	0.06	0.06	211.57
Building Vendor Trips	0.18	1.82	1.85	0.01	0.03	0.07	0.10	0.01	0.07	0.08	831.35
Building Worker Trips	0.08	0.14	2.76	0.01	0.03	0.01	0.04	0.01	0.01	0.02	523.28
2019	5.06	0.48	0.92	0.00	0.01	0.02	0.03	0.00	0.02	0.02	264.01
Building 07/01/2015-02/28/2019	0.07	0.48	0.89	0.00	0.01	0.02	0.03	0.00	0.02	0.02	258.04
Building Off Road Diesel	0.03	0.19	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	34.86
Building Vendor Trips	0.03	0.27	0.28	0.00	0.00	0.01	0.02	0.00	0.01	0.01	136.97
Building Worker Trips	0.01	0.02	0.42	0.00	0.00	0.00	0.01	0.00	0.00	0.00	86.21
Coating 03/01/2019-08/30/2019	4.99	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97
Architectural Coating	4.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97

Phase Assumptions

Phase: Mass Grading 10/1/2014 - 6/30/2015 - Default Mass Site Grading Description

Total Acres Disturbed: 21.38

Maximum Daily Acreage Disturbed: 5.34

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Phase: Building Construction 7/1/2015 - 2/28/2019 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 3/1/2019 - 8/30/2019 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014	0.11	0.85	0.53	0.00	0.53	0.04	0.57	0.11	0.04	0.15	103.47
Mass Grading 10/01/2014-06/30/2015	0.11	0.85	0.53	0.00	0.53	0.04	0.57	0.11	0.04	0.15	103.47
Mass Grading Dust	0.00	0.00	0.00	0.00	0.53	0.00	0.53	0.11	0.00	0.11	0.00
Mass Grading Off Road Diesel	0.11	0.85	0.50	0.00	0.00	0.04	0.04	0.00	0.04	0.04	99.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.23

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2015	0.53	3.77	4.65	0.01	1.07	0.19	1.25	0.23	0.17	0.40	994.15
Mass Grading 10/01/2014-06/30/2015	0.20	1.53	1.01	0.00	1.04	0.07	1.11	0.22	0.07	0.29	202.25
Mass Grading Dust	0.00	0.00	0.00	0.00	1.04	0.00	1.04	0.22	0.00	0.22	0.00
Mass Grading Off Road Diesel	0.20	1.53	0.95	0.00	0.00	0.07	0.07	0.00	0.07	0.07	193.98
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.26
Building 07/01/2015-02/28/2019	0.33	2.24	3.65	0.01	0.03	0.11	0.14	0.01	0.10	0.11	791.90
Building Off Road Diesel	0.16	0.79	0.64	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.00
Building Vendor Trips	0.12	1.35	1.19	0.00	0.02	0.05	0.07	0.01	0.05	0.05	420.36
Building Worker Trips	0.05	0.09	1.82	0.00	0.01	0.01	0.02	0.00	0.01	0.01	264.54
2016	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Building 07/01/2015-02/28/2019	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Building Off Road Diesel	0.29	1.46	1.23	0.00	0.00	0.09	0.09	0.00	0.08	0.08	211.57
Building Vendor Trips	0.22	2.35	2.17	0.01	0.03	0.09	0.12	0.01	0.08	0.09	831.24
Building Worker Trips	0.10	0.17	3.29	0.01	0.03	0.01	0.04	0.01	0.01	0.02	523.17
2017	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Building 07/01/2015-02/28/2019	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Building Off Road Diesel	0.26	1.35	1.20	0.00	0.00	0.08	0.08	0.00	0.07	0.07	210.76
Building Vendor Trips	0.20	2.06	1.99	0.01	0.03	0.08	0.11	0.01	0.07	0.08	828.12
Building Worker Trips	0.09	0.15	3.00	0.01	0.03	0.01	0.04	0.01	0.01	0.02	521.24

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2018	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Building 07/01/2015-02/28/2019	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Building Off Road Diesel	0.23	1.26	1.18	0.00	0.00	0.07	0.07	0.00	0.06	0.06	211.57
Building Vendor Trips	0.18	1.82	1.85	0.01	0.03	0.07	0.10	0.01	0.07	0.08	831.35
Building Worker Trips	0.08	0.14	2.76	0.01	0.03	0.01	0.04	0.01	0.01	0.02	523.28
2019	5.06	0.48	0.92	0.00	0.01	0.02	0.03	0.00	0.02	0.02	264.01
Building 07/01/2015-02/28/2019	0.07	0.48	0.89	0.00	0.01	0.02	0.03	0.00	0.02	0.02	258.04
Building Off Road Diesel	0.03	0.19	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	34.86
Building Vendor Trips	0.03	0.27	0.28	0.00	0.00	0.01	0.02	0.00	0.01	0.01	136.97
Building Worker Trips	0.01	0.02	0.42	0.00	0.00	0.00	0.01	0.00	0.00	0.00	86.21
Coating 03/01/2019-08/30/2019	4.99	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97
Architectural Coating	4.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 10/1/2014 - 6/30/2015 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Merced Station - Construction - Mitigated.urb924

Project Name: Merced Station - Construction - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014 TOTALS (tons/year unmitigated)	0.11	0.85	0.53	0.00	3.52	0.04	3.57	0.74	0.04	0.77	103.47
2014 TOTALS (tons/year mitigated)	0.11	0.85	0.53	0.00	0.48	0.04	0.52	0.10	0.04	0.14	103.47
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	85.32	86.33	0.00	82.04	0.00
2015 TOTALS (tons/year unmitigated)	0.53	3.77	4.65	0.01	6.92	0.19	7.10	1.45	0.17	1.62	994.15
2015 TOTALS (tons/year mitigated)	0.53	3.77	4.65	0.01	0.97	0.19	1.15	0.21	0.17	0.38	994.15
Percent Reduction	0.00	0.00	0.00	0.00	85.98	0.00	83.74	85.75	0.00	76.78	0.00
2016 TOTALS (tons/year unmitigated)	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
2016 TOTALS (tons/year mitigated)	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017 TOTALS (tons/year unmitigated)	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11

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2017 TOTALS (tons/year mitigated)	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
2018 TOTALS (tons/year mitigated)	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019 TOTALS (tons/year unmitigated)	5.06	0.48	0.92	0.00	0.01	0.02	0.03	0.00	0.02	0.02	264.01
2019 TOTALS (tons/year mitigated)	4.56	0.48	0.92	0.00	0.01	0.02	0.03	0.00	0.02	0.02	264.01
Percent Reduction	9.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014	0.11	0.85	0.53	0.00	3.52	0.04	3.57	0.74	0.04	0.77	103.47
Mass Grading 10/01/2014-06/30/2015	0.11	0.85	0.53	0.00	3.52	0.04	3.57	0.74	0.04	0.77	103.47
Mass Grading Dust	0.00	0.00	0.00	0.00	3.52	0.00	3.52	0.74	0.00	0.74	0.00
Mass Grading Off Road Diesel	0.11	0.85	0.50	0.00	0.00	0.04	0.04	0.00	0.04	0.04	99.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.23

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2015	0.53	3.77	4.65	0.01	6.92	0.19	7.10	1.45	0.17	1.62	994.15
Mass Grading 10/01/2014-06/30/2015	0.20	1.53	1.01	0.00	6.89	0.07	6.96	1.44	0.07	1.51	202.25
Mass Grading Dust	0.00	0.00	0.00	0.00	6.89	0.00	6.89	1.44	0.00	1.44	0.00
Mass Grading Off Road Diesel	0.20	1.53	0.95	0.00	0.00	0.07	0.07	0.00	0.07	0.07	193.98
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.26
Building 07/01/2015-02/28/2019	0.33	2.24	3.65	0.01	0.03	0.11	0.14	0.01	0.10	0.11	791.90
Building Off Road Diesel	0.16	0.79	0.64	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.00
Building Vendor Trips	0.12	1.35	1.19	0.00	0.02	0.05	0.07	0.01	0.05	0.05	420.36
Building Worker Trips	0.05	0.09	1.82	0.00	0.01	0.01	0.02	0.00	0.01	0.01	264.54
2016	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Building 07/01/2015-02/28/2019	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Building Off Road Diesel	0.29	1.46	1.23	0.00	0.00	0.09	0.09	0.00	0.08	0.08	211.57
Building Vendor Trips	0.22	2.35	2.17	0.01	0.03	0.09	0.12	0.01	0.08	0.09	831.24
Building Worker Trips	0.10	0.17	3.29	0.01	0.03	0.01	0.04	0.01	0.01	0.02	523.17
2017	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Building 07/01/2015-02/28/2019	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Building Off Road Diesel	0.26	1.35	1.20	0.00	0.00	0.08	0.08	0.00	0.07	0.07	210.76
Building Vendor Trips	0.20	2.06	1.99	0.01	0.03	0.08	0.11	0.01	0.07	0.08	828.12
Building Worker Trips	0.09	0.15	3.00	0.01	0.03	0.01	0.04	0.01	0.01	0.02	521.24

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2018	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Building 07/01/2015-02/28/2019	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Building Off Road Diesel	0.23	1.26	1.18	0.00	0.00	0.07	0.07	0.00	0.06	0.06	211.57
Building Vendor Trips	0.18	1.82	1.85	0.01	0.03	0.07	0.10	0.01	0.07	0.08	831.35
Building Worker Trips	0.08	0.14	2.76	0.01	0.03	0.01	0.04	0.01	0.01	0.02	523.28
2019	5.06	0.48	0.92	0.00	0.01	0.02	0.03	0.00	0.02	0.02	264.01
Building 07/01/2015-02/28/2019	0.07	0.48	0.89	0.00	0.01	0.02	0.03	0.00	0.02	0.02	258.04
Building Off Road Diesel	0.03	0.19	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	34.86
Building Vendor Trips	0.03	0.27	0.28	0.00	0.00	0.01	0.02	0.00	0.01	0.01	136.97
Building Worker Trips	0.01	0.02	0.42	0.00	0.00	0.00	0.01	0.00	0.00	0.00	86.21
Coating 03/01/2019-08/30/2019	4.99	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97
Architectural Coating	4.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97

Phase Assumptions

Phase: Mass Grading 10/1/2014 - 6/30/2015 - Default Mass Site Grading Description

Total Acres Disturbed: 21.38

Maximum Daily Acreage Disturbed: 5.34

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Phase: Building Construction 7/1/2015 - 2/28/2019 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 3/1/2019 - 8/30/2019 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2014	0.11	0.85	0.53	0.00	0.48	0.04	0.52	0.10	0.04	0.14	103.47
Mass Grading 10/01/2014-06/30/2015	0.11	0.85	0.53	0.00	0.48	0.04	0.52	0.10	0.04	0.14	103.47
Mass Grading Dust	0.00	0.00	0.00	0.00	0.48	0.00	0.48	0.10	0.00	0.10	0.00
Mass Grading Off Road Diesel	0.11	0.85	0.50	0.00	0.00	0.04	0.04	0.00	0.04	0.04	99.25
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.23

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2015	0.53	3.77	4.65	0.01	0.97	0.19	1.15	0.21	0.17	0.38	994.15
Mass Grading 10/01/2014-06/30/2015	0.20	1.53	1.01	0.00	0.94	0.07	1.02	0.20	0.07	0.27	202.25
Mass Grading Dust	0.00	0.00	0.00	0.00	0.94	0.00	0.94	0.20	0.00	0.20	0.00
Mass Grading Off Road Diesel	0.20	1.53	0.95	0.00	0.00	0.07	0.07	0.00	0.07	0.07	193.98
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.26
Building 07/01/2015-02/28/2019	0.33	2.24	3.65	0.01	0.03	0.11	0.14	0.01	0.10	0.11	791.90
Building Off Road Diesel	0.16	0.79	0.64	0.00	0.00	0.05	0.05	0.00	0.05	0.05	107.00
Building Vendor Trips	0.12	1.35	1.19	0.00	0.02	0.05	0.07	0.01	0.05	0.05	420.36
Building Worker Trips	0.05	0.09	1.82	0.00	0.01	0.01	0.02	0.00	0.01	0.01	264.54
2016	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Building 07/01/2015-02/28/2019	0.60	3.97	6.69	0.01	0.06	0.20	0.25	0.02	0.18	0.20	1,565.98
Building Off Road Diesel	0.29	1.46	1.23	0.00	0.00	0.09	0.09	0.00	0.08	0.08	211.57
Building Vendor Trips	0.22	2.35	2.17	0.01	0.03	0.09	0.12	0.01	0.08	0.09	831.24
Building Worker Trips	0.10	0.17	3.29	0.01	0.03	0.01	0.04	0.01	0.01	0.02	523.17
2017	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Building 07/01/2015-02/28/2019	0.54	3.56	6.19	0.01	0.06	0.17	0.23	0.02	0.16	0.18	1,560.11
Building Off Road Diesel	0.26	1.35	1.20	0.00	0.00	0.08	0.08	0.00	0.07	0.07	210.76
Building Vendor Trips	0.20	2.06	1.99	0.01	0.03	0.08	0.11	0.01	0.07	0.08	828.12
Building Worker Trips	0.09	0.15	3.00	0.01	0.03	0.01	0.04	0.01	0.01	0.02	521.24

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2018	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Building 07/01/2015-02/28/2019	0.49	3.21	5.79	0.01	0.06	0.16	0.21	0.02	0.14	0.16	1,566.20
Building Off Road Diesel	0.23	1.26	1.18	0.00	0.00	0.07	0.07	0.00	0.06	0.06	211.57
Building Vendor Trips	0.18	1.82	1.85	0.01	0.03	0.07	0.10	0.01	0.07	0.08	831.35
Building Worker Trips	0.08	0.14	2.76	0.01	0.03	0.01	0.04	0.01	0.01	0.02	523.28
2019	4.56	0.48	0.92	0.00	0.01	0.02	0.03	0.00	0.02	0.02	264.01
Building 07/01/2015-02/28/2019	0.07	0.48	0.89	0.00	0.01	0.02	0.03	0.00	0.02	0.02	258.04
Building Off Road Diesel	0.03	0.19	0.19	0.00	0.00	0.01	0.01	0.00	0.01	0.01	34.86
Building Vendor Trips	0.03	0.27	0.28	0.00	0.00	0.01	0.02	0.00	0.01	0.01	136.97
Building Worker Trips	0.01	0.02	0.42	0.00	0.00	0.00	0.01	0.00	0.00	0.00	86.21
Coating 03/01/2019-08/30/2019	4.49	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97
Architectural Coating	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 10/1/2014 - 6/30/2015 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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The following mitigation measures apply to Phase: Architectural Coating 3/1/2019 - 8/30/2019 - Default Architectural Coating Description

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

B.2-8 Power Stations

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\TP - Construction - Programmatic.urb924

Project Name: TP - Construction - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016 TOTALS (tons/year unmitigated)	0.11	0.82	0.57	0.00	0.15	0.04	0.19	0.03	0.04	0.07	123.47
2016 TOTALS (tons/year mitigated)	0.11	0.82	0.57	0.00	0.02	0.04	0.06	0.00	0.04	0.04	123.47
Percent Reduction	0.00	0.00	0.00	0.00	84.78	0.00	66.97	84.67	0.00	39.02	0.00
2017 TOTALS (tons/year unmitigated)	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
2017 TOTALS (tons/year mitigated)	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	0.09	0.35	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.45
2018 TOTALS (tons/year mitigated)	0.09	0.35	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.45
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.11	0.82	0.57	0.00	0.15	0.04	0.19	0.03	0.04	0.07	123.47
Mass Grading 07/01/2016-10/31/2016	0.09	0.70	0.47	0.00	0.15	0.03	0.18	0.03	0.03	0.06	102.22
Mass Grading Dust	0.00	0.00	0.00	0.00	0.15	0.00	0.15	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.09	0.70	0.44	0.00	0.00	0.03	0.03	0.00	0.03	0.03	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.46
Building 11/01/2016-07/31/2018	0.02	0.12	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	21.25
Building Off Road Diesel	0.02	0.12	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	19.65
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62
2017	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Building 11/01/2016-07/31/2018	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.78
Building Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.64

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2018	0.09	0.35	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.45
Building 11/01/2016-07/31/2018	0.05	0.35	0.33	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.40
Building Off Road Diesel	0.05	0.34	0.32	0.00	0.00	0.02	0.02	0.00	0.02	0.02	67.90
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38
Building Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13
Coating 08/01/2018-11/30/2018	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Architectural Coating	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04

Phase Assumptions

Phase: Mass Grading 7/1/2016 - 10/31/2016 - Default Mass Site Grading Description

Total Acres Disturbed: 0.66

Maximum Daily Acreage Disturbed: 0.17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 11/1/2016 - 7/31/2018 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

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Phase: Architectural Coating 8/1/2018 - 11/30/2018 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.11	0.82	0.57	0.00	0.02	0.04	0.06	0.00	0.04	0.04	123.47
Mass Grading 07/01/2016-10/31/2016	0.09	0.70	0.47	0.00	0.02	0.03	0.06	0.00	0.03	0.03	102.22
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.70	0.44	0.00	0.00	0.03	0.03	0.00	0.03	0.03	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.46
Building 11/01/2016-07/31/2018	0.02	0.12	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	21.25
Building Off Road Diesel	0.02	0.12	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	19.65
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62

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2017	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Building 11/01/2016-07/31/2018	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.78
Building Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.64
2018	0.09	0.35	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.45
Building 11/01/2016-07/31/2018	0.05	0.35	0.33	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.40
Building Off Road Diesel	0.05	0.34	0.32	0.00	0.00	0.02	0.02	0.00	0.02	0.02	67.90
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38
Building Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13
Coating 08/01/2018-11/30/2018	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Architectural Coating	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 7/1/2016 - 10/31/2016 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\TP - Construction - Mitigated.urb924

Project Name: TP - Construction - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016 TOTALS (tons/year unmitigated)	0.11	0.82	0.57	0.00	0.15	0.04	0.19	0.03	0.04	0.07	123.47
2016 TOTALS (tons/year mitigated)	0.11	0.82	0.57	0.00	0.02	0.04	0.06	0.00	0.04	0.04	123.47
Percent Reduction	0.00	0.00	0.00	0.00	86.18	0.00	68.07	86.06	0.00	39.66	0.00
2017 TOTALS (tons/year unmitigated)	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
2017 TOTALS (tons/year mitigated)	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	0.09	0.35	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.45
2018 TOTALS (tons/year mitigated)	0.08	0.35	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.45
Percent Reduction	4.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.11	0.82	0.57	0.00	0.15	0.04	0.19	0.03	0.04	0.07	123.47
Mass Grading 07/01/2016-10/31/2016	0.09	0.70	0.47	0.00	0.15	0.03	0.18	0.03	0.03	0.06	102.22
Mass Grading Dust	0.00	0.00	0.00	0.00	0.15	0.00	0.15	0.03	0.00	0.03	0.00
Mass Grading Off Road Diesel	0.09	0.70	0.44	0.00	0.00	0.03	0.03	0.00	0.03	0.03	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.46
Building 11/01/2016-07/31/2018	0.02	0.12	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	21.25
Building Off Road Diesel	0.02	0.12	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	19.65
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62
2017	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Building 11/01/2016-07/31/2018	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.78
Building Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.64

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2018	0.09	0.35	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.45
Building 11/01/2016-07/31/2018	0.05	0.35	0.33	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.40
Building Off Road Diesel	0.05	0.34	0.32	0.00	0.00	0.02	0.02	0.00	0.02	0.02	67.90
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38
Building Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13
Coating 08/01/2018-11/30/2018	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Architectural Coating	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04

Phase Assumptions

Phase: Mass Grading 7/1/2016 - 10/31/2016 - Default Mass Site Grading Description

Total Acres Disturbed: 0.66

Maximum Daily Acreage Disturbed: 0.17

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 11/1/2016 - 7/31/2018 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3/27/2011 12:34:21 PM

Phase: Architectural Coating 8/1/2018 - 11/30/2018 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.11	0.82	0.57	0.00	0.02	0.04	0.06	0.00	0.04	0.04	123.47
Mass Grading 07/01/2016-10/31/2016	0.09	0.70	0.47	0.00	0.02	0.03	0.05	0.00	0.03	0.03	102.22
Mass Grading Dust	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.09	0.70	0.44	0.00	0.00	0.03	0.03	0.00	0.03	0.03	97.76
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.46
Building 11/01/2016-07/31/2018	0.02	0.12	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	21.25
Building Off Road Diesel	0.02	0.12	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	19.65
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62

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2017	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Building 11/01/2016-07/31/2018	0.09	0.66	0.58	0.00	0.00	0.03	0.03	0.00	0.03	0.03	125.56
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.78
Building Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.64
2018	0.08	0.35	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.45
Building 11/01/2016-07/31/2018	0.05	0.35	0.33	0.00	0.00	0.02	0.02	0.00	0.02	0.02	73.40
Building Off Road Diesel	0.05	0.34	0.32	0.00	0.00	0.02	0.02	0.00	0.02	0.02	67.90
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38
Building Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.13
Coating 08/01/2018-11/30/2018	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Architectural Coating	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 7/1/2016 - 10/31/2016 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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The following mitigation measures apply to Phase: Architectural Coating 8/1/2018 - 11/30/2018 - Default Architectural Coating Description

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\SS - Construction - Programmatic.urb924

Project Name: SS - Construction - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016 TOTALS (tons/year unmitigated)	0.14	1.05	0.70	0.00	0.07	0.05	0.12	0.01	0.05	0.06	153.91
2016 TOTALS (tons/year mitigated)	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Percent Reduction	0.00	0.00	0.00	0.00	84.52	0.00	48.22	84.22	0.00	19.57	0.00
2017 TOTALS (tons/year unmitigated)	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
2017 TOTALS (tons/year mitigated)	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
2018 TOTALS (tons/year mitigated)	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.14	1.05	0.70	0.00	0.07	0.05	0.12	0.01	0.05	0.06	153.91
Mass Grading 07/01/2016-12/30/2016	0.14	1.05	0.70	0.00	0.07	0.05	0.12	0.01	0.05	0.06	153.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.14	1.05	0.66	0.00	0.00	0.05	0.05	0.00	0.05	0.05	147.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.71
2017	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building 01/02/2017-05/31/2018	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building 01/02/2017-05/31/2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building Off Road Diesel	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Coating 06/01/2018-11/30/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

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Phase Assumptions

Phase: Mass Grading 7/1/2016 - 12/30/2016 - Default Mass Site Grading Description

Total Acres Disturbed: 0.21

Maximum Daily Acreage Disturbed: 0.05

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 1/2/2017 - 5/31/2018 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 6/1/2018 - 11/30/2018 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

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	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Mass Grading 07/01/2016-12/30/2016	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.14	1.05	0.66	0.00	0.00	0.05	0.05	0.00	0.05	0.05	147.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.71
2017	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building 01/02/2017-05/31/2018	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building 01/02/2017-05/31/2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building Off Road Diesel	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Coating 06/01/2018-11/30/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 7/1/2016 - 12/30/2016 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

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PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\SS - Construction - Mitigated.urb924

Project Name: SS - Construction - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016 TOTALS (tons/year unmitigated)	0.14	1.05	0.70	0.00	0.07	0.05	0.12	0.01	0.05	0.06	153.91
2016 TOTALS (tons/year mitigated)	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Percent Reduction	0.00	0.00	0.00	0.00	85.91	0.00	49.01	85.60	0.00	19.89	0.00
2017 TOTALS (tons/year unmitigated)	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
2017 TOTALS (tons/year mitigated)	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
2018 TOTALS (tons/year mitigated)	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Percent Reduction	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.14	1.05	0.70	0.00	0.07	0.05	0.12	0.01	0.05	0.06	153.91
Mass Grading 07/01/2016-12/30/2016	0.14	1.05	0.70	0.00	0.07	0.05	0.12	0.01	0.05	0.06	153.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.14	1.05	0.66	0.00	0.00	0.05	0.05	0.00	0.05	0.05	147.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.71
2017	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building 01/02/2017-05/31/2018	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building 01/02/2017-05/31/2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building Off Road Diesel	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Coating 06/01/2018-11/30/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

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Phase Assumptions

Phase: Mass Grading 7/1/2016 - 12/30/2016 - Default Mass Site Grading Description

Total Acres Disturbed: 0.21

Maximum Daily Acreage Disturbed: 0.05

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 1/2/2017 - 5/31/2018 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 6/1/2018 - 11/30/2018 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

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	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Mass Grading 07/01/2016-12/30/2016	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.14	1.05	0.66	0.00	0.00	0.05	0.05	0.00	0.05	0.05	147.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.71
2017	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building 01/02/2017-05/31/2018	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building 01/02/2017-05/31/2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building Off Road Diesel	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Coating 06/01/2018-11/30/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 7/1/2016 - 12/30/2016 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

3/27/2011 12:36:35 PM

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Architectural Coating 6/1/2018 - 11/30/2018 - Default Architectural Coating Description

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

3/27/2011 12:37:29 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\PS - Construction - Programmatic.urb924

Project Name: PS - Construction - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016 TOTALS (tons/year unmitigated)	0.14	1.05	0.70	0.00	0.05	0.05	0.10	0.01	0.05	0.06	153.91
2016 TOTALS (tons/year mitigated)	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Percent Reduction	0.00	0.00	0.00	0.00	84.42	0.00	43.52	84.04	0.00	16.41	0.00
2017 TOTALS (tons/year unmitigated)	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
2017 TOTALS (tons/year mitigated)	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
2018 TOTALS (tons/year mitigated)	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3/27/2011 12:37:29 PM

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.14	1.05	0.70	0.00	0.05	0.05	0.10	0.01	0.05	0.06	153.91
Mass Grading 07/01/2016-12/30/2016	0.14	1.05	0.70	0.00	0.05	0.05	0.10	0.01	0.05	0.06	153.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.14	1.05	0.66	0.00	0.00	0.05	0.05	0.00	0.05	0.05	147.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.71
2017	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building 01/02/2017-05/31/2018	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building 01/02/2017-05/31/2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building Off Road Diesel	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Coating 06/01/2018-11/30/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

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Phase Assumptions

Phase: Mass Grading 7/1/2016 - 12/30/2016 - Default Mass Site Grading Description

Total Acres Disturbed: 0.18

Maximum Daily Acreage Disturbed: 0.04

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 1/2/2017 - 5/31/2018 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 6/1/2018 - 11/30/2018 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

3/27/2011 12:37:29 PM

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Mass Grading 07/01/2016-12/30/2016	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.14	1.05	0.66	0.00	0.00	0.05	0.05	0.00	0.05	0.05	147.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.71
2017	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building 01/02/2017-05/31/2018	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building 01/02/2017-05/31/2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building Off Road Diesel	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Coating 06/01/2018-11/30/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 7/1/2016 - 12/30/2016 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

3/27/2011 12:37:29 PM

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/27/2011 12:39:51 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\PS - Construction - Mitigated.urb924

Project Name: PS - Construction - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016 TOTALS (tons/year unmitigated)	0.14	1.05	0.70	0.00	0.05	0.05	0.10	0.01	0.05	0.06	153.91
2016 TOTALS (tons/year mitigated)	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Percent Reduction	0.00	0.00	0.00	0.00	85.80	0.00	44.23	85.42	0.00	16.68	0.00
2017 TOTALS (tons/year unmitigated)	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
2017 TOTALS (tons/year mitigated)	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
2018 TOTALS (tons/year mitigated)	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Percent Reduction	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3/27/2011 12:39:51 PM

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.14	1.05	0.70	0.00	0.05	0.05	0.10	0.01	0.05	0.06	153.91
Mass Grading 07/01/2016-12/30/2016	0.14	1.05	0.70	0.00	0.05	0.05	0.10	0.01	0.05	0.06	153.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.14	1.05	0.66	0.00	0.00	0.05	0.05	0.00	0.05	0.05	147.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.71
2017	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building 01/02/2017-05/31/2018	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building 01/02/2017-05/31/2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building Off Road Diesel	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Coating 06/01/2018-11/30/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

3/27/2011 12:39:51 PM

Phase Assumptions

Phase: Mass Grading 7/1/2016 - 12/30/2016 - Default Mass Site Grading Description

Total Acres Disturbed: 0.18

Maximum Daily Acreage Disturbed: 0.04

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 1/2/2017 - 5/31/2018 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 6/1/2018 - 11/30/2018 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

3/27/2011 12:39:51 PM

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2016	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Mass Grading 07/01/2016-12/30/2016	0.14	1.05	0.70	0.00	0.01	0.05	0.06	0.00	0.05	0.05	153.91
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.14	1.05	0.66	0.00	0.00	0.05	0.05	0.00	0.05	0.05	147.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.71
2017	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building 01/02/2017-05/31/2018	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	117.44
Building Off Road Diesel	0.09	0.65	0.55	0.00	0.00	0.03	0.03	0.00	0.03	0.03	116.14
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building 01/02/2017-05/31/2018	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	49.24
Building Off Road Diesel	0.04	0.24	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	48.69
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21
Coating 06/01/2018-11/30/2018	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 7/1/2016 - 12/30/2016 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

3/27/2011 12:39:51 PM

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Architectural Coating 6/1/2018 - 11/30/2018 - Default Architectural Coating Description

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

B.2-9 Demobilization

4/11/2011 2:03:51 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Demobilization.urb924

Project Name: Demobilization

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017 TOTALS (tons/year unmitigated)	20.61	167.10	56.53	0.00	0.01	6.79	6.80	0.00	6.51	6.52	19,279.25
2017 TOTALS (tons/year mitigated)	20.61	167.10	56.53	0.00	0.01	6.79	6.80	0.00	6.51	6.52	19,279.25
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018 TOTALS (tons/year unmitigated)	52.69	407.28	138.45	0.01	0.03	16.97	17.00	0.01	16.32	16.33	46,164.13
2018 TOTALS (tons/year mitigated)	52.69	407.28	138.45	0.01	0.03	16.97	17.00	0.01	16.32	16.33	46,164.13
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019 TOTALS (tons/year unmitigated)	56.03	414.46	141.58	0.01	0.03	17.70	17.73	0.01	17.04	17.05	46,164.15
2019 TOTALS (tons/year mitigated)	56.03	414.46	141.58	0.01	0.03	17.70	17.73	0.01	17.04	17.05	46,164.15
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017	20.61	167.10	56.53	0.00	0.01	6.79	6.80	0.00	6.51	6.52	19,279.25
Mass Grading 08/01/2017-12/31/2019	20.61	167.10	56.53	0.00	0.01	6.79	6.80	0.00	6.51	6.52	19,279.25
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	20.57	167.02	55.00	0.00	0.00	6.78	6.78	0.00	6.51	6.51	19,013.86
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.04	0.08	1.53	0.00	0.01	0.01	0.02	0.00	0.01	0.01	265.39
2018	52.69	407.28	138.45	0.01	0.03	16.97	17.00	0.01	16.32	16.33	46,164.13
Mass Grading 08/01/2017-12/31/2019	52.69	407.28	138.45	0.01	0.03	16.97	17.00	0.01	16.32	16.33	46,164.13
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	52.60	407.12	135.10	0.00	0.00	16.95	16.95	0.00	16.30	16.30	45,528.59
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.10	0.16	3.35	0.01	0.03	0.02	0.05	0.01	0.01	0.02	635.54
2019	56.03	414.46	141.58	0.01	0.03	17.70	17.73	0.01	17.04	17.05	46,164.15
Mass Grading 08/01/2017-12/31/2019	56.03	414.46	141.58	0.01	0.03	17.70	17.73	0.01	17.04	17.05	46,164.15
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	55.95	414.31	138.50	0.00	0.00	17.68	17.68	0.00	17.03	17.03	45,528.59
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.09	0.15	3.08	0.01	0.03	0.02	0.05	0.01	0.01	0.02	635.56

4/11/2011 2:03:51 PM

Phase Assumptions

Phase: Mass Grading 8/1/2017 - 12/31/2019 - Demobilization

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off Road Diesel calculated using the Named Equipment EMS functions.

The Off Road Equipment was based on the Named Equipment List: C:\Documents and Settings\Avanti_Tamhane\Application Data\Urbemis\Version9a\Data\const equip_2005 manf year.equip;Mobilization Equipment List
Off-Road Equipment:

30 Off Highway Trucks (175 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

30 Off Highway Trucks (210 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

60 Off Highway Tractors (500 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

10 Off Highway Trucks (300 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

10 Water Trucks (210 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

20 Other Equipment (10 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

10 Off Highway Trucks (200 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

10 Off Highway Trucks (330 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

4 Tractors/Loaders/Backhoes (87 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year
2 Excavators (300 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

4 Rubber Tired Dozers (125 hp) operating at a 0.65 load factor for 8 hours per day; Engine Built/Rebuilt in 2005 with average useage of 1683 hrs/year

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

4/11/2011 2:03:51 PM

2017	20.61	167.10	56.53	0.00	0.01	6.79	6.80	0.00	6.51	6.52	19,279.25
Mass Grading 08/01/2017-12/31/2019	20.61	167.10	56.53	0.00	0.01	6.79	6.80	0.00	6.51	6.52	19,279.25
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	20.57	167.02	55.00	0.00	0.00	6.78	6.78	0.00	6.51	6.51	19,013.86
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.04	0.08	1.53	0.00	0.01	0.01	0.02	0.00	0.01	0.01	265.39
2018	52.69	407.28	138.45	0.01	0.03	16.97	17.00	0.01	16.32	16.33	46,164.13
Mass Grading 08/01/2017-12/31/2019	52.69	407.28	138.45	0.01	0.03	16.97	17.00	0.01	16.32	16.33	46,164.13
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	52.60	407.12	135.10	0.00	0.00	16.95	16.95	0.00	16.30	16.30	45,528.59
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.10	0.16	3.35	0.01	0.03	0.02	0.05	0.01	0.01	0.02	635.54
2019	56.03	414.46	141.58	0.01	0.03	17.70	17.73	0.01	17.04	17.05	46,164.15
Mass Grading 08/01/2017-12/31/2019	56.03	414.46	141.58	0.01	0.03	17.70	17.73	0.01	17.04	17.05	46,164.15
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	55.95	414.31	138.50	0.00	0.00	17.68	17.68	0.00	17.03	17.03	45,528.59
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.09	0.15	3.08	0.01	0.03	0.02	0.05	0.01	0.01	0.02	635.56

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2017 - 12/31/2019 - Demobilization

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

4/11/2011 2:03:51 PM

PM10: 61% PM25: 61%

3/28/2011 8:34:48 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PI Construction - Programmatic.urb924

Project Name: HMF - PI Construction - Programmatic

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017 TOTALS (tons/year unmitigated)	0.33	2.48	1.58	0.00	33.88	0.11	33.99	7.08	0.10	7.18	400.36
2017 TOTALS (tons/year mitigated)	0.33	2.48	1.58	0.00	5.10	0.11	5.21	1.07	0.10	1.17	400.36
Percent Reduction	0.00	0.00	0.00	0.00	84.94	0.00	84.67	84.94	0.00	83.76	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

3/28/2011 8:34:48 AM

2017	0.33	2.48	1.58	0.00	33.88	0.11	33.99	7.08	0.10	7.18	400.36
Mass Grading 08/01/2017-11/30/2017	0.33	2.48	1.58	0.00	33.88	0.11	33.99	7.08	0.10	7.18	400.36
Mass Grading Dust	0.00	0.00	0.00	0.00	33.88	0.00	33.88	7.08	0.00	7.08	0.00
Mass Grading Off Road Diesel	0.33	2.48	1.52	0.00	0.00	0.11	0.11	0.00	0.10	0.10	389.09
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.28

Phase Assumptions

Phase: Mass Grading 8/1/2017 - 11/30/2017 - Default Mass Site Grading Description

Total Acres Disturbed: 154

Maximum Daily Acreage Disturbed: 38.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

3 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

3/28/2011 8:34:48 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017	0.33	2.48	1.58	0.00	5.10	0.11	5.21	1.07	0.10	1.17	400.36
Mass Grading 08/01/2017-11/30/2017	0.33	2.48	1.58	0.00	5.10	0.11	5.21	1.07	0.10	1.17	400.36
Mass Grading Dust	0.00	0.00	0.00	0.00	5.10	0.00	5.10	1.07	0.00	1.07	0.00
Mass Grading Off Road Diesel	0.33	2.48	1.52	0.00	0.00	0.11	0.11	0.00	0.10	0.10	389.09
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.28

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2017 - 11/30/2017 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/28/2011 8:36:18 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PI Construction - Mitigated.urb924

Project Name: HMF - PI Construction - Mitigated

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017 TOTALS (tons/year unmitigated)	0.33	2.48	1.58	0.00	33.88	0.11	33.99	7.08	0.10	7.18	400.36
2017 TOTALS (tons/year mitigated)	0.33	2.48	1.58	0.00	4.63	0.11	4.74	0.97	0.10	1.07	400.36
Percent Reduction	0.00	0.00	0.00	0.00	86.34	0.00	86.06	86.34	0.00	85.13	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2017	0.33	2.48	1.58	0.00	33.88	0.11	33.99	7.08	0.10	7.18	400.36
Mass Grading 08/01/2017-11/30/2017	0.33	2.48	1.58	0.00	33.88	0.11	33.99	7.08	0.10	7.18	400.36
Mass Grading Dust	0.00	0.00	0.00	0.00	33.88	0.00	33.88	7.08	0.00	7.08	0.00
Mass Grading Off Road Diesel	0.33	2.48	1.52	0.00	0.00	0.11	0.11	0.00	0.10	0.10	389.09
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.28

Phase Assumptions

Phase: Mass Grading 8/1/2017 - 11/30/2017 - Default Mass Site Grading Description

Total Acres Disturbed: 154

Maximum Daily Acreage Disturbed: 38.5

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

3 Scrapers (313 hp) operating at a 0.72 load factor for 8 hours per day

3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

3/28/2011 8:36:18 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2017	0.33	2.48	1.58	0.00	4.63	0.11	4.74	0.97	0.10	1.07	400.36
Mass Grading 08/01/2017-11/30/2017	0.33	2.48	1.58	0.00	4.63	0.11	4.74	0.97	0.10	1.07	400.36
Mass Grading Dust	0.00	0.00	0.00	0.00	4.63	0.00	4.63	0.97	0.00	0.97	0.00
Mass Grading Off Road Diesel	0.33	2.48	1.52	0.00	0.00	0.11	0.11	0.00	0.10	0.10	389.09
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.28

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 8/1/2017 - 11/30/2017 - Default Mass Site Grading Description

For Soil Stablizing Measures, the Replace ground cover in disturbed areas quickly mitigation reduces emissions by:

PM10: 5% PM25: 5%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

3/28/2011 9:28:24 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PII Construction.urb924

Project Name: HMF - PII Construction

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2018 TOTALS (tons/year unmitigated)	0.06	0.41	0.41	0.00	0.00	0.02	0.02	0.00	0.02	0.02	85.44

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2018	0.06	0.41	0.41	0.00	0.00	0.02	0.02	0.00	0.02	0.02	85.44
Asphalt 06/01/2018-06/29/2018	0.02	0.11	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	16.29
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.02	0.10	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	13.36
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.15
Building 07/02/2018-12/31/2018	0.04	0.31	0.31	0.00	0.00	0.02	0.02	0.00	0.01	0.01	69.15
Building Off Road Diesel	0.04	0.29	0.27	0.00	0.00	0.01	0.01	0.00	0.01	0.01	58.52
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.52
Building Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.11

Phase Assumptions

Phase: Paving 6/1/2018 - 6/29/2018 - Default Paving Description

Acres to be Paved: 1.31

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 7/2/2018 - 12/31/2018 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3/28/2011 9:28:24 AM

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Construction Related Mitigation Measures

3/30/2011 1:01:12 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PII Elevated Structures.urb924

Project Name: HMF - Phase II Elevated Structures

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2018 TOTALS (tons/year unmitigated)	0.28	2.00	1.67	0.00	0.00	0.09	0.09	0.00	0.08	0.08	474.63

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2018	0.28	2.00	1.67	0.00	0.00	0.09	0.09	0.00	0.08	0.08	474.63
Building 07/02/2018-09/28/2018	0.22	1.64	1.25	0.00	0.00	0.07	0.07	0.00	0.07	0.07	364.91
Building Off Road Diesel	0.22	1.63	1.08	0.00	0.00	0.07	0.07	0.00	0.07	0.07	331.33
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.59
Building 10/01/2018-12/31/2018	0.06	0.37	0.41	0.00	0.00	0.02	0.02	0.00	0.01	0.01	109.72
Building Off Road Diesel	0.05	0.36	0.23	0.00	0.00	0.01	0.01	0.00	0.01	0.01	75.61
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.10

Phase Assumptions

Phase: Building Construction 7/2/2018 - 9/28/2018 - Quarter 1 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8.6 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 1.1 hours per day

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 6.9 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 2.3 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 11.4 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 11.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 11.4 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Pumps (600 hp) operating at a 0.74 load factor for 5.7 hours per day

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1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 5.7 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 5.7 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 5.7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 11.4 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

Phase: Building Construction 10/1/2018 - 12/31/2018 - Quarter 2 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 2.9 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 1.1 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 7.1 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PII At-Grade Alignment.urb924

Project Name: HMF - Phase II At-Grade Alignment

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2018 TOTALS (tons/year unmitigated)	0.30	2.11	1.70	0.00	0.00	0.09	0.10	0.00	0.08	0.09	490.64

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2018	0.30	2.11	1.70	0.00	0.00	0.09	0.10	0.00	0.08	0.09	490.64
Building 07/02/2018-08/15/2018	0.08	0.53	0.43	0.00	0.00	0.02	0.02	0.00	0.02	0.02	123.42
Building Off Road Diesel	0.07	0.53	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	106.37
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.05
Building 08/16/2018-09/28/2018	0.07	0.52	0.41	0.00	0.00	0.02	0.02	0.00	0.02	0.02	120.58
Building Off Road Diesel	0.07	0.52	0.33	0.00	0.00	0.02	0.02	0.00	0.02	0.02	104.05
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.54
Building 10/01/2018-11/15/2018	0.08	0.55	0.44	0.00	0.00	0.02	0.02	0.00	0.02	0.02	128.12
Building Off Road Diesel	0.08	0.55	0.35	0.00	0.00	0.02	0.02	0.00	0.02	0.02	110.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.57
Building 11/16/2018-12/31/2018	0.07	0.51	0.41	0.00	0.00	0.02	0.02	0.00	0.02	0.02	118.51
Building Off Road Diesel	0.07	0.50	0.32	0.00	0.00	0.02	0.02	0.00	0.02	0.02	101.98
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.54

Phase Assumptions

Phase: Building Construction 7/2/2018 - 8/15/2018 - Quarter 1 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 4.6 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

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1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 8/16/2018 - 9/28/2018 - Quarter 2 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 1.4 hours per day

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1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 10/1/2018 - 11/15/2018 - Quarter 3 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 1.4 hours per day

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1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 11/16/2018 - 12/31/2018 - Quarter 4 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

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1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PII Elevated Alignment.urb924

Project Name: HMF - Phase II Elevated Alignment

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2018 TOTALS (tons/year unmitigated)	0.16	1.10	1.06	0.00	0.00	0.05	0.05	0.00	0.04	0.04	291.58

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2018	0.16	1.10	1.06	0.00	0.00	0.05	0.05	0.00	0.04	0.04	291.58
Building 07/02/2018-09/28/2018	0.08	0.53	0.49	0.00	0.00	0.02	0.02	0.00	0.02	0.02	145.77
Building Off Road Diesel	0.07	0.52	0.31	0.00	0.00	0.02	0.02	0.00	0.02	0.02	112.18
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.59
Building 10/01/2018-12/31/2018	0.09	0.56	0.57	0.00	0.00	0.03	0.03	0.00	0.02	0.02	145.81
Building Off Road Diesel	0.08	0.56	0.39	0.00	0.00	0.03	0.03	0.00	0.02	0.02	111.70
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.01	0.01	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.10

Phase Assumptions

Phase: Building Construction 7/2/2018 - 9/28/2018 - Quarter 3 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 5.7 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 4.6 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 7.1 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.5 load factor for 6.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

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Phase: Building Construction 10/1/2018 - 12/31/2018 - Quarter 4 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 5.7 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 4.6 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 11.4 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.5 load factor for 6.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 5.7 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 5.7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PIII Construction.urb924

Project Name: HMF - PIII Construction

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2021 TOTALS (tons/year unmitigated)	8.14	1.57	2.93	0.01	0.05	0.08	0.13	0.02	0.07	0.09	1,256.20
2021 TOTALS (tons/year mitigated)	7.37	1.57	2.93	0.01	0.05	0.08	0.13	0.02	0.07	0.09	1,256.20
Percent Reduction	9.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2021	8.14	1.57	2.93	0.01	0.05	0.08	0.13	0.02	0.07	0.09	1,256.20
Asphalt 01/01/2021-01/29/2021	0.21	0.23	0.16	0.00	0.00	0.01	0.02	0.00	0.01	0.01	97.40
Paving Off-Gas	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.02	0.11	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	14.90
Paving On Road Diesel	0.01	0.12	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	81.15
Paving Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35
Building 02/01/2021-07/30/2021	0.21	1.34	2.75	0.01	0.04	0.07	0.11	0.01	0.06	0.08	1,149.57
Building Off Road Diesel	0.09	0.54	0.57	0.00	0.00	0.03	0.03	0.00	0.02	0.02	105.38
Building Vendor Trips	0.09	0.74	0.94	0.01	0.02	0.03	0.06	0.01	0.03	0.04	640.88
Building Worker Trips	0.03	0.06	1.24	0.00	0.02	0.01	0.03	0.01	0.01	0.02	403.32
Coating 07/01/2021-07/30/2021	7.72	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.23
Architectural Coating	7.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.23

Phase Assumptions

Phase: Paving 1/1/2021 - 1/29/2021 - Default Paving Description

Acres to be Paved: 135.99

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Phase: Building Construction 2/1/2021 - 7/30/2021 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

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1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 7/1/2021 - 7/30/2021 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 130

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2021	7.37	1.57	2.93	0.01	0.05	0.08	0.13	0.02	0.07	0.09	1,256.20
Asphalt 01/01/2021-01/29/2021	0.21	0.23	0.16	0.00	0.00	0.01	0.02	0.00	0.01	0.01	97.40
Paving Off-Gas	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.02	0.11	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	14.90
Paving On Road Diesel	0.01	0.12	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	81.15
Paving Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35
Building 02/01/2021-07/30/2021	0.21	1.34	2.75	0.01	0.04	0.07	0.11	0.01	0.06	0.08	1,149.57
Building Off Road Diesel	0.09	0.54	0.57	0.00	0.00	0.03	0.03	0.00	0.02	0.02	105.38
Building Vendor Trips	0.09	0.74	0.94	0.01	0.02	0.03	0.06	0.01	0.03	0.04	640.88
Building Worker Trips	0.03	0.06	1.24	0.00	0.02	0.01	0.03	0.01	0.01	0.02	403.32
Coating 07/01/2021-07/30/2021	6.95	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.23
Architectural Coating	6.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.23

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Architectural Coating 7/1/2021 - 7/30/2021 - Default Architectural Coating Description

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PIII Elevated Structures.urb924

Project Name: HMF - Phase III Elevated Structures

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2021 TOTALS (tons/year unmitigated)	0.24	1.63	1.47	0.00	0.00	0.07	0.07	0.00	0.06	0.07	472.98

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2021	0.24	1.63	1.47	0.00	0.00	0.07	0.07	0.00	0.06	0.07	472.98
Building 02/01/2021-04/30/2021	0.20	1.34	1.14	0.00	0.00	0.06	0.06	0.00	0.05	0.05	364.92
Building Off Road Diesel	0.19	1.34	1.04	0.00	0.00	0.06	0.06	0.00	0.05	0.05	331.33
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.59
Building 05/03/2021-07/30/2021	0.05	0.29	0.33	0.00	0.00	0.01	0.01	0.00	0.01	0.01	108.06
Building Off Road Diesel	0.04	0.28	0.22	0.00	0.00	0.01	0.01	0.00	0.01	0.01	74.47
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.59

Phase Assumptions

Phase: Building Construction 2/1/2021 - 4/30/2021 - Quarter 1 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8.6 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 1.1 hours per day

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 6.9 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 2.3 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 11.4 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 11.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 11.4 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Pumps (600 hp) operating at a 0.74 load factor for 5.7 hours per day

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1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 5.7 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 5.7 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 5.7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 11.4 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

Phase: Building Construction 5/3/2021 - 7/30/2021 - Quarter 2 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 2.9 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 1.1 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 7.1 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PIII At-Grade Alignment.urb924

Project Name: HMF - Phase III A:-Grade Alignment

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2021 TOTALS (tons/year unmitigated)	0.26	1.70	1.50	0.00	0.00	0.07	0.08	0.00	0.07	0.07	486.87

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2021	0.26	1.70	1.50	0.00	0.00	0.07	0.08	0.00	0.07	0.07	486.87
Building 02/01/2021-03/15/2021	0.06	0.41	0.36	0.00	0.00	0.02	0.02	0.00	0.02	0.02	115.95
Building Off Road Diesel	0.06	0.40	0.31	0.00	0.00	0.02	0.02	0.00	0.02	0.02	99.93
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.02
Building 03/16/2021-04/30/2021	0.07	0.45	0.39	0.00	0.00	0.02	0.02	0.00	0.02	0.02	128.12
Building Off Road Diesel	0.07	0.44	0.34	0.00	0.00	0.02	0.02	0.00	0.02	0.02	110.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.57
Building 05/03/2021-06/15/2021	0.07	0.42	0.37	0.00	0.00	0.02	0.02	0.00	0.02	0.02	120.59
Building Off Road Diesel	0.06	0.42	0.32	0.00	0.00	0.02	0.02	0.00	0.02	0.02	104.05
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.54
Building 06/16/2021-07/30/2021	0.07	0.43	0.38	0.00	0.00	0.02	0.02	0.00	0.02	0.02	122.22
Building Off Road Diesel	0.06	0.42	0.32	0.00	0.00	0.02	0.02	0.00	0.02	0.02	105.17
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.05

Phase Assumptions

Phase: Building Construction 2/1/2021 - 3/15/2021 - Quarter 1 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 4.6 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

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1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 3/16/2021 - 4/30/2021 - Quarter 2 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 1.4 hours per day

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1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 5/3/2021 - 6/15/2021 - Quarter 3 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 1.4 hours per day

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1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

Phase: Building Construction 6/16/2021 - 7/30/2021 - Quarter 4 Construction

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 0.3 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 0.3 hours per day

1 Crawler Tractors (147 hp) operating at a 0.64 load factor for 4.3 hours per day

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1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 4.3 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 1.4 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 0.6 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 2.9 hours per day

1 Off Highway Tractors (267 hp) operating at a 0.65 load factor for 2.9 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 3.6 hours per day

1 Other Equipment (400 hp) operating at a 0.62 load factor for 4.3 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.51 load factor for 4.3 hours per day

1 Other Material Handling Equipment (400 hp) operating at a 0.59 load factor for 2.9 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 2.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 3.6 hours per day

1 Rough Terrain Forklifts (93 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Scrapers (313 hp) operating at a 0.72 load factor for 3.6 hours per day

1 Skid Steer Loaders (44 hp) operating at a 0.55 load factor for 2.9 hours per day

1 Surfacing Eqipment (362 hp) operating at a 0.45 load factor for 2.9 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Trenchers (63 hp) operating at a 0.75 load factor for 2.9 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 1.4 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 4.3 hours per day

3/30/2011 1:16:52 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\HMF - PIII Elevated Alignment.urb924

Project Name: HMF - Phase III Elevated Alignment

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2021 TOTALS (tons/year unmitigated)	0.14	0.88	0.89	0.00	0.00	0.04	0.04	0.00	0.03	0.03	289.38

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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2021	0.14	0.88	0.89	0.00	0.00	0.04	0.04	0.00	0.03	0.03	289.38
Building 02/01/2021-04/30/2021	0.07	0.42	0.41	0.00	0.00	0.02	0.02	0.00	0.01	0.02	145.77
Building Off Road Diesel	0.07	0.42	0.30	0.00	0.00	0.02	0.02	0.00	0.01	0.01	112.18
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.59
Building 05/03/2021-07/30/2021	0.07	0.45	0.48	0.00	0.00	0.02	0.02	0.00	0.02	0.02	143.60
Building Off Road Diesel	0.07	0.45	0.38	0.00	0.00	0.02	0.02	0.00	0.02	0.02	110.01
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.59

Phase Assumptions

Phase: Building Construction 2/1/2021 - 4/30/2021 - Quarter 3 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 5.7 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 4.6 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 7.1 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.5 load factor for 6.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

3/30/2011 1:16:52 PM

Phase: Building Construction 5/3/2021 - 7/30/2021 - Quarter 4 Construction

Off-Road Equipment:

1 Aerial Lifts (60 hp) operating at a 0.46 load factor for 5.7 hours per day

1 Air Compressors (106 hp) operating at a 0.48 load factor for 2.9 hours per day

1 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 4.6 hours per day

1 Concrete/Industrial Saws (10 hp) operating at a 0.73 load factor for 11.4 hours per day

1 Dumpers/Tenders (16 hp) operating at a 0.38 load factor for 2.9 hours per day

1 Generator Sets (549 hp) operating at a 0.74 load factor for 1.4 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 1.4 hours per day

1 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 2.1 hours per day

1 Other General Industrial Equipment (500 hp) operating at a 0.5 load factor for 6.9 hours per day

1 Pressure Washers (1 hp) operating at a 0.6 load factor for 1.4 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 5.7 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 5.7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 4.3 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 5.7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 2.9 hours per day

B.3 Road Construction Emissions Model Output

Road Construction Emissions Model

Version 6.3.2

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 C10 through C25.

Input Type

Project Name	Roads Greater Than 2.5 Miles	
Construction Start Year	2014	Enter a Year between 2005 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	30.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	6.027	miles
Total Project Area	35.1	acres
Maximum Area Disturbed/Day	0.5	acres
Water Trucks Used?	2	1. Yes No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

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.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months
Grubbing/Land Clearing		3.00
Grading/Excavation		12.00
Drainage/Utilities/Sub-Grade		10.50
Paving		4.50
Totals	0.00	30.00

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Dozers	1.44	6.24	12.03	0.50	0.46	1245.79
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.53	5.72	13.21	0.51	0.47	1623.76
	12	Signal Boards	4.25	13.65	13.40	1.10	1.02	1481.54
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	7.2	25.6	38.6	2.1	1.9	4351.1
	Grubbing/Land Clearing	tons per phase	0.2	0.8	1.3	0.1	0.1	143.6

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Excavators	0.54	3.25	3.96	0.22	0.20	547.36
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.72	3.83	5.38	0.30	0.27	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
	0	Other Construction Equipment	0.02	0.09	0.11	0.01	0.01	14.39
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Loaders	0.50	2.70	3.77	0.21	0.19	458.86
	1	Scrapers	1.51	5.64	12.95	0.50	0.46	1623.76
	12	Signal Boards	4.14	13.55	13.28	1.08	0.99	1481.54
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	7.4	29.1	39.4	2.3	2.1	4773.8
	Grading	tons per phase	1.0	3.8	5.2	0.3	0.3	630.1

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.68	3.83	4.93	0.27	0.25	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Plate Compactors	0.02	0.09	0.11	0.00	0.00	14.83
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.45	5.35	12.05	0.46	0.43	1623.76
	12	Signal Boards	3.77	13.17	12.83	0.99	0.91	1481.54
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Trenchers	0.62	2.51	3.82	0.32	0.29	353.84
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	6.5	24.9	33.7	2.0	1.9	4121.8
	Drainage	tons per phase	0.8	2.9	3.9	0.2	0.2	476.1

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Pavers	0.65	2.75	3.93	0.33	0.30	386.18
	1	Paving Equipment	0.49	2.07	2.96	0.25	0.23	291.96
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rollers	0.41	2.02	2.60	0.21	0.20	299.86
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	12	Signal Boards	3.42	12.85	12.42	0.90	0.83	1481.54
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	5.0	19.7	21.9	1.7	1.6	2459.5
	Paving	tons per phase	0.2	1.0	1.1	0.1	0.1	121.7

Road Construction Emissions Model

Version 6.3.2

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 C10 through C25.

Input Type

Project Name	Roads Less Than 2.5 Miles	
Construction Start Year	2015	Enter a Year between 2005 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	24.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	1.948	miles
Total Project Area	11.3	acres
Maximum Area Disturbed/Day	0.5	acres
Water Trucks Used?	2	1. Yes No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

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.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months
Grubbing/Land Clearing		2.40
Grading/Excavation		9.60
Drainage/Utilities/Sub-Grade		8.40
Paving		3.60
Totals	0.00	24.00

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Dozers	1.38	5.84	11.27	0.46	0.43	1245.79
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.46	5.39	12.19	0.47	0.43	1623.76
	4	Signal Boards	1.24	4.28	4.17	0.32	0.30	478.85
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	4.1	15.5	27.6	1.3	1.2	3348.4
	Grubbing/Land Clearing	tons per phase	0.1	0.4	0.7	0.0	0.0	88.4

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Excavators	0.51	3.25	3.62	0.20	0.18	547.36
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.68	3.83	5.00	0.28	0.25	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
	0	Other Construction Equipment	0.01	0.09	0.11	0.01	0.01	14.39
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Loaders	0.47	2.70	3.49	0.19	0.18	458.86
	1	Scrapers	1.46	5.39	12.19	0.47	0.43	1623.76
	4	Signal Boards	1.24	4.28	4.17	0.32	0.30	478.85
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	4.4	19.5	28.6	1.5	1.3	3771.1
	Grading	tons per phase	0.5	2.1	3.0	0.2	0.1	398.2

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.64	3.82	4.52	0.25	0.23	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Plate Compactors	0.02	0.09	0.11	0.00	0.00	14.83
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.38	5.10	11.22	0.43	0.40	1623.76
	4	Signal Boards	1.11	4.15	4.01	0.29	0.27	478.85
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Trenchers	0.59	2.49	3.63	0.30	0.28	353.84
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	3.7	15.7	23.5	1.3	1.2	3119.1
	Drainage	tons per phase	0.3	1.4	2.2	0.1	0.1	288.2

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Pavers	0.65	2.75	3.93	0.33	0.30	386.18
	1	Paving Equipment	0.49	2.07	2.96	0.25	0.23	291.96
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rollers	0.41	2.02	2.60	0.21	0.20	299.86
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	4	Signal Boards	1.11	4.15	4.01	0.29	0.27	478.85
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00

Road Construction Emissions Model

Version 6.3.2

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 C10 through C25.

Input Type

Project Name	Roads Less Than 1 Mile	
Construction Start Year	2017	Enter a Year between 2005 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	12.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	0.414	miles
Total Project Area	2.4	acres
Maximum Area Disturbed/Day	0.5	acres
Water Trucks Used?	2	1. Yes No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

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.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months
Grubbing/Land Clearing		1.20
Grading/Excavation		4.80
Drainage/Utilities/Sub-Grade		4.20
Paving		1.80
Totals	0.00	12.00

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Dozers	1.25	5.15	9.83	0.40	0.37	1245.79
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.31	4.84	10.31	0.39	0.36	1623.76
	1	Signal Boards	0.21	0.86	0.82	0.05	0.05	101.77
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	2.8	10.9	21.0	0.8	0.8	2971.3
	Grubbing/Land Clearing	tons per phase	0.0	0.1	0.3	0.0	0.0	39.2

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Excavators	0.44	3.24	2.83	0.15	0.14	547.36
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.60	3.82	4.08	0.23	0.21	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
	0	Other Construction Equipment	0.01	0.09	0.09	0.01	0.01	14.39
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Loaders	0.41	2.69	2.84	0.16	0.14	458.87
	1	Scrapers	1.31	4.84	10.31	0.39	0.36	1623.76
	1	Signal Boards	0.21	0.86	0.82	0.05	0.05	101.77
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	3.0	15.5	21.0	1.0	0.9	3394.0
	Grading	tons per phase	0.2	0.8	1.1	0.1	0.0	179.2

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.60	3.82	4.08	0.23	0.21	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Plate Compactors	0.02	0.09	0.11	0.00	0.00	14.83
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.31	4.84	10.31	0.39	0.36	1623.76
	1	Signal Boards	0.21	0.86	0.82	0.05	0.05	101.77
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Trenchers	0.56	2.47	3.42	0.28	0.26	353.83
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	2.7	12.1	18.7	1.0	0.9	2742.1
	Drainage	tons per phase	0.1	0.6	0.9	0.0	0.0	126.7

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Pavers	0.61	2.73	3.69	0.31	0.28	386.18
	1	Paving Equipment	0.46	2.05	2.78	0.23	0.21	291.96
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rollers	0.38	2.01	2.42	0.19	0.18	299.86
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Signal Boards	0.21	0.86	0.82	0.05	0.05	101.77
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	1.7	7.7	9.7	0.8	0.7	1079.8
	Paving	tons per phase	0.0	0.2	0.2	0.0	0.0	21.4

Road Construction Emissions Model
Data Entry Worksheet

Version 6.3.2

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 C10 through C25.

Input Type

Project Name	Structures	
Construction Start Year	2013	Enter a Year between 2005 and 2025 (inclusive)
Project Type	3	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	12.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	0.103	miles
Total Project Area	0.6	acres
Maximum Area Disturbed/Day	0.5	acres
Water Trucks Used?	2	1. Yes No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	20.0	yd^3 (assume 20 if unknown)

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.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

Construction Periods	User Override of Construction Months	Program Calculated Months
Grubbing/Land Clearing		1.20
Grading/Excavation		4.80
Drainage/Utilities/Sub-Grade		4.20
Paving		1.80
Totals	0.00	12.00

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Dozers	1.51	6.67	12.84	0.53	0.49	1245.79
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.61	6.11	14.29	0.55	0.51	1623.76
	0	Signal Boards	0.08	0.24	0.24	0.02	0.02	25.32
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	3.2	13.0	27.4	1.1	1.0	2894.9
	Grubbing/Land Clearing	tons per phase	0.0	0.2	0.4	0.0	0.0	38.2

Grading/Excavation	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	1	Cranes	0.64	2.17	5.85	0.21	0.20	739.64
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Excavators	0.59	3.25	4.37	0.25	0.23	547.36
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.77	3.84	5.86	0.33	0.30	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
	0	Other Construction Equipment	0.02	0.09	0.13	0.01	0.01	14.39
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Loaders	0.54	2.71	4.11	0.23	0.21	458.86
	1	Scrapers	1.61	6.11	14.29	0.55	0.51	1623.76
	0	Signal Boards	0.08	0.24	0.24	0.02	0.02	25.32
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	4.2	18.4	34.8	1.6	1.5	4057.2
	Grading	tons per phase	0.2	1.0	1.8	0.1	0.1	214.2

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.77	3.84	5.86	0.33	0.30	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Plate Compactors	0.02	0.09	0.11	0.00	0.00	14.83
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.61	6.11	14.29	0.55	0.51	1623.76
	0	Signal Boards	0.08	0.24	0.24	0.02	0.02	25.32
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Trenchers	0.70	2.55	4.29	0.37	0.34	353.84
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	3.2	12.8	24.8	1.3	1.2	2665.6
	Drainage	tons per phase	0.1	0.6	1.1	0.1	0.1	123.2

Paving	Default Number of Vehicles		ROG	CO	NOx	PM10	PM2.5	CO2
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Pavers	0.78	2.82	4.67	0.41	0.38	386.18
	1	Paving Equipment	0.58	2.12	3.52	0.31	0.28	291.96
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rollers	0.50	2.07	3.18	0.27	0.25	299.86
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	0	Signal Boards	0.08	0.24	0.24	0.02	0.02	25.32
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	1.9	7.3	11.6	1.0	0.9	1003.3
	Paving	tons per phase	0.0	0.1	0.2	0.0	0.0	19.9

B.4 EMFAC Output

B.4-1 Emission Factors for Programmatic Material Hauling Construction Emissions

Title : Haul
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/04/01 09:35:17
Scen Year: 2013 -- All model years in the range 1969 to 2013 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****

Year: 2013 -- Model Years 1969 to 2013 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	2.513	0.199	0.146	0.164	9.005	0.939	0.602	0.607	3.525	0.442	0.545	0.544

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	100.68	5.244	1.493	2.463	495.433	31.98	2.653	3.064	162.221	13.997	2.508	2.978

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	3.525	1.921	7.368	6.556	25.749	8.583	10.454	10.434	6.989	4.102	10.068	9.881

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	507.469	507.469	1505	1355.056	507.469	507.469	1662.352	1648.566	507.469	507.469	1642.687	1606.761

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.006	0.005	0.014	0.013	0.013	0.005	0.016	0.016	0.007	0.005	0.016	0.015

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.01	0.005	0.169	0.145	0.01	0.009	0.453	0.448	0.01	0.006	0.418	0.405

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.033	0.032

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.015	0.018	0.026	0.026

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.206	0.038	0.007	0.012	0.454	0.12	0.028	0.029	0.245	0.064	0.025	0.027

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.007	0.005	0.156	0.133	0.007	0.008	0.417	0.412	0.007	0.006	0.384	0.372

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.003	0.003	0.003	0.003	0.003	0.003	0.009	0.009	0.003	0.003	0.008	0.008

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.005	0.005	0.005	0.005	0.012	0.012	0.012	0.012	0.006	0.008	0.011	0.011

B.4-1 Emission Factors for Programmatic Material Hauling Construction Emissions

Title : Haul
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/04/01 09:35:17
Scen Year: 2014 -- All model years in the range 1970 to 2014 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2014 -- Model Years 1970 to 2014 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	2.493	0.168	0.137	0.149	8.959	0.836	0.539	0.543	3.554	0.385	0.489	0.487

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	99.88	4.417	1.421	2.202	492.976	31.07	2.467	2.863	164.36	13.06	2.337	2.769

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	3.469	1.635	6.543	5.795	25.407	7.973	9.148	9.136	7.068	3.69	8.824	8.66

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	507.469	507.469	1505	1351.697	507.469	507.469	1662.352	1648.397	507.469	507.469	1642.762	1606.158

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.006	0.005	0.014	0.013	0.013	0.005	0.016	0.016	0.007	0.005	0.016	0.015

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.01	0.005	0.158	0.134	0.01	0.009	0.407	0.402	0.01	0.006	0.376	0.364

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.033	0.032

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.015	0.018	0.026	0.026

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.206	0.032	0.006	0.011	0.452	0.114	0.025	0.026	0.246	0.059	0.023	0.024

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.007	0.005	0.145	0.123	0.007	0.008	0.374	0.37	0.007	0.006	0.346	0.335

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.003	0.003	0.003	0.003	0.003	0.003	0.009	0.009	0.003	0.003	0.008	0.008

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.005	0.005	0.005	0.005	0.012	0.012	0.012	0.012	0.006	0.008	0.011	0.011

B.4-1 Emission Factors for Programmatic Material Hauling Construction Emissions

Title : Haul
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/04/01 09:35:17
Scen Year: 2015 -- All model years in the range 1971 to 2015 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2015 -- Model Years 1971 to 2015 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	2.471	0.141	0.128	0.136	8.89	0.742	0.481	0.484	3.427	0.334	0.437	0.435

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	99.098	3.708	1.352	1.966	489.554	30.259	2.29	2.664	157.208	12.228	2.174	2.565

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	3.42	1.385	5.779	5.095	25.068	7.436	7.967	7.961	6.642	3.326	7.695	7.554

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	507.469	507.469	1505	1348.483	507.469	507.469	1662.352	1648.301	507.469	507.469	1642.845	1605.658

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.006	0.005	0.014	0.013	0.013	0.005	0.016	0.016	0.007	0.005	0.016	0.015

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.01	0.005	0.147	0.124	0.01	0.009	0.364	0.359	0.01	0.006	0.337	0.326

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.033	0.032

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.015	0.018	0.026	0.026

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.205	0.027	0.006	0.01	0.449	0.109	0.022	0.023	0.241	0.054	0.02	0.021

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.007	0.005	0.135	0.114	0.007	0.008	0.335	0.331	0.007	0.006	0.31	0.3

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.003	0.003	0.003	0.003	0.003	0.003	0.009	0.009	0.003	0.003	0.008	0.008

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.005	0.005	0.005	0.005	0.012	0.012	0.012	0.012	0.006	0.008	0.011	0.011

B.4-1 Emission Factors for Programmatic Material Hauling Construction Emissions

Title : Haul
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/04/01 09:35:17
Scen Year: 2016 -- All model years in the range 1972 to 2016 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2016 -- Model Years 1972 to 2016 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	2.453	0.12	0.12	0.124	8.848	0.662	0.428	0.432	3.427	0.292	0.39	0.388

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	98.365	3.129	1.294	1.775	487.171	29.634	2.127	2.49	157.546	11.555	2.024	2.389

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	3.374	1.178	5.112	4.487	24.78	6.978	6.931	6.932	6.632	3.022	6.706	6.585

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	507.469	507.469	1505	1345.45	507.469	507.469	1662.352	1648.215	507.469	507.469	1642.94	1605.228

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.006	0.005	0.014	0.013	0.012	0.005	0.016	0.016	0.007	0.005	0.016	0.015

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.01	0.005	0.137	0.116	0.01	0.009	0.325	0.321	0.01	0.006	0.301	0.292

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.033	0.032

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.015	0.018	0.026	0.026

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.204	0.023	0.006	0.009	0.448	0.106	0.02	0.021	0.241	0.049	0.018	0.019

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.007	0.005	0.126	0.107	0.007	0.008	0.299	0.295	0.007	0.006	0.277	0.268

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.003	0.003	0.003	0.003	0.003	0.003	0.009	0.009	0.003	0.003	0.008	0.008

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.005	0.005	0.005	0.005	0.012	0.012	0.012	0.012	0.006	0.008	0.011	0.011

B.4-1 Emission Factors for Programmatic Material Hauling Construction Emissions

Title : Haul
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/04/01 09:35:17
Scen Year: 2017 -- All model years in the range 1973 to 2017 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2017 -- Model Years 1973 to 2017 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	2.433	0.102	0.112	0.114	8.794	0.594	0.382	0.385	3.379	0.257	0.349	0.347

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	97.644	2.646	1.242	1.607	484.589	29.132	1.976	2.329	155.202	11.003	1.886	2.226

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	3.335	1.005	4.524	3.955	24.535	6.603	6.028	6.036	6.488	2.771	5.843	5.741

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	507.469	507.469	1505	1342.802	507.469	507.469	1662.352	1648.14	507.469	507.469	1643.033	1604.877

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.006	0.005	0.014	0.013	0.012	0.005	0.016	0.016	0.007	0.005	0.016	0.015

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.01	0.005	0.129	0.109	0.01	0.009	0.289	0.285	0.01	0.006	0.269	0.26

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.033	0.032

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.015	0.017	0.026	0.026

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.203	0.02	0.005	0.008	0.446	0.102	0.018	0.019	0.239	0.046	0.016	0.017

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.007	0.005	0.119	0.1	0.007	0.008	0.266	0.263	0.007	0.006	0.248	0.24

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.003	0.003	0.003	0.003	0.003	0.003	0.009	0.009	0.003	0.003	0.008	0.008

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.005	0.005	0.005	0.005	0.012	0.012	0.012	0.012	0.006	0.007	0.011	0.011

B.4-1 Emission Factors for Programmatic Material Hauling Construction Emissions

Title : Haul
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/04/01 09:35:17
Scen Year: 2018 -- All model years in the range 1974 to 2018 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2018 -- Model Years 1974 to 2018 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	2.414	0.086	0.106	0.105	8.747	0.533	0.341	0.344	3.516	0.226	0.313	0.31

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	96.955	2.234	1.198	1.451	482.506	28.679	1.837	2.182	164.044	10.513	1.759	2.079

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	3.302	0.857	4.009	3.492	24.349	6.275	5.249	5.262	6.964	2.553	5.097	5.012

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	507.469	507.469	1505	1340.51	507.469	507.469	1662.352	1648.09	507.469	507.469	1643.108	1604.575

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.006	0.005	0.014	0.013	0.012	0.005	0.016	0.016	0.007	0.005	0.016	0.015

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.01	0.005	0.122	0.103	0.01	0.009	0.257	0.254	0.01	0.006	0.241	0.233

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.033	0.032

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.015	0.017	0.026	0.026

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.203	0.017	0.005	0.007	0.444	0.099	0.016	0.017	0.245	0.043	0.015	0.016

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.007	0.005	0.112	0.094	0.007	0.008	0.237	0.234	0.007	0.006	0.221	0.214

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.003	0.003	0.003	0.003	0.003	0.003	0.009	0.009	0.003	0.003	0.008	0.008

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0.005	0.005	0.005	0.005	0.012	0.012	0.012	0.012	0.007	0.007	0.011	0.011

B.4-1 Emission Factors for Programmatic Material Hauling Construction Emissions

Title : Haul
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/04/01 09:35:17
Scen Year: 2021 -- All model years in the range 1977 to 2021 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2021 -- Model Years 1977 to 2021 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.054	0.093	0.086	0	0.402	0.253	0.255	0	0.16	0.233	0.231

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	1.385	1.106	1.153	0	27.974	1.527	1.852	0	9.49	1.475	1.753

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.552	2.858	2.465	0	5.647	3.614	3.639	0	2.105	3.522	3.473

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	507.469	1505	1335.014	0	507.469	1662.352	1648.138	0	507.469	1643.227	1603.853

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.005	0.014	0.013	0	0.005	0.016	0.016	0	0.005	0.016	0.015

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.005	0.107	0.089	0	0.009	0.19	0.187	0	0.006	0.18	0.174

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.033	0.032

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.017	0.026	0.026

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.012	0.004	0.006	0	0.093	0.012	0.013	0	0.036	0.011	0.012

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.005	0.098	0.082	0	0.008	0.175	0.172	0	0.006	0.165	0.16

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.003	0.003	0.003	0	0.003	0.009	0.009	0	0.003	0.008	0.008

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
55	0	0.005	0.005	0.005	0	0.012	0.012	0.012	0	0.007	0.011	0.011

B.4-2 Emission Factors for Mitigated Material Hauling Construction Emissions

Title : Haul
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/07/23 16:56:52
Scen Year: 2010 -- Model year 2010 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2010 -- Model Years 2010 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006
District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.007	0.021	0.018	0	0.113	0.116	0.116	0	0.043	0.104	0.102
55	0	0.006	0.019	0.016	0	0.095	0.097	0.097	0	0.037	0.087	0.085

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.132	0.252	0.229	0	12.678	0.638	0.849	0	4.474	0.59	0.757
55	0	0.149	0.26	0.239	0	14.295	0.702	0.94	0	5.044	0.647	0.836

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.139	0.562	0.482	0	3.041	0.937	0.974	0	1.143	0.89	0.901
55	0	0.149	0.708	0.602	0	3.26	0.901	0.943	0	1.226	0.877	0.892

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	450.085	1505	1304.534	0	450.085	1701.031	1679.142	0	450.085	1676.437	1623.619
55	0	507.469	1505	1315.439	0	507.469	1662.352	1642.144	0	507.469	1642.611	1593.721

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.004	0.014	0.012	0	0.005	0.016	0.016	0	0.004	0.016	0.016
55	0	0.005	0.014	0.013	0	0.005	0.016	0.016	0	0.005	0.016	0.015

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.001	0.023	0.019	0	0.003	0.045	0.044	0	0.002	0.042	0.041
55	0	0.001	0.021	0.017	0	0.003	0.059	0.058	0	0.002	0.054	0.052

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.033	0.032
55	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.033	0.032

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.018	0.026	0.026
55	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.018	0.026	0.026

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.001	0.022	0.018	0	0.003	0.042	0.041	0	0.002	0.039	0.037
55	0	0.001	0.019	0.016	0	0.003	0.054	0.053	0	0.001	0.05	0.048

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.003	0.003	0.003	0	0.003	0.009	0.009	0	0.003	0.008	0.008
55	0	0.003	0.003	0.003	0	0.003	0.009	0.009	0	0.003	0.008	0.008

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.005	0.005	0.005	0	0.012	0.012	0.012	0	0.008	0.011	0.011
55	0	0.005	0.005	0.005	0	0.012	0.012	0.012	0	0.008	0.011	0.011

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
45	0	0.006	0.001	0.002	0	0.063	0.005	0.006	0	0.026	0.005	0.006
55	0	0.005	0.001	0.002	0	0.058	0.005	0.005	0	0.023	0.004	0.005

APPENDIX C

2035 Operational Emissions

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C.1 HST 2035 Operational Emissions

C.1-1 Summary of Operation-Related GHG Emissions

This tab presents the operational GHG emissions from all High Speed Train components.

Operational Year 2035

Operational Emissions

High Speed Train Component	CO_2 Emissions (tpy)	CO_2 Emissions (metric tons/year)
Merced Train Station	37,952	34,430
Fresno Train Station	24,530	22,253
Overnight Layover / Servicing Facility	176	160
Train Dust Wake	-	-
2035 Heavy Maintenance Facility CO_2	25,658	23,276
2035 Total CO_2 Without VMT	**88,315**	**80,119**
2035 Total CO_2e Without VMT[1]	**92,731**	**84,125**
Net Difference in Regional VMT:	-834,707	-757,241
Net Difference in Regional Power Demand:	101,632	92,200
Net Difference in Regional Flight Demand:	-1,372	-1,245

Notes:

1. According to the EPA (http://www.epa.gov/oms/climate/420f05004.htm), emissions of CH_4 and N_2O from passenger vehicles are much lower than emissions of CO_2, contributing in the range of 5-6 percent of the CO_2-equivalent emissions. In addition, the URBEMIS2007 model does not estimate CH_4 and N_2O emissions. Therefore, to account for the CH_4 and N_2O emissions, the CO_2 emissions were conservatively increased by 5 percent to calculate the CO_2-equivalent emissions. Assumed that this approach for passenger vehicles was applicable to all emissions sources.

C.1-2 Summary of Operational Emissions

This tab presents the operational emissions from all High Speed Train components.

Operation Emissions

High Speed Train Component	Emissions (tpy)						
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
Operational Year 2035							
Merced Train Station [1]	0.84	64	4.7	0.38	3.7	2.1	37,952
Fresno Train Station [2]	0.55	41	3.4	0.25	2.4	1.4	24,530
Overnight Layover / Servicing Facility	0.0039	0.30	0.021	0.0018	0.018	0.010	176
Train Wake Dust	-	-	-	-	22	3.2	-
Heavy Maintenance Facility	0.77	21	5.1	0.55	0.83	0.52	25,658
2035 Total Without VMT	**2.2**	**126**	**13**	**1.2**	**29**	**7.3**	**88,315**
Net Difference in Regional VMT:	-76	-1,532	-415	-7.7	-79	-46	-834,707
Net Difference in Regional Power Demand:	3.7	38	26	3.3	5.5	4.8	101,632
Net Difference in Regional Flight Demand:	0.00	-7.3	-7.3	-0.52	0.00	0.00	-1,372

Notes:

1. Emissions do not include CO emissions from traffic congestion in the parking structures.
2. Fresno Train Station operation emissions were calculated by URS as part of the analysis for the Fresno - Bakersfield segment.

C.1-3 Merced Train Station: Operational Emissions

This tab estimates operational emissions from employee and visitor commutes to the Merced Train Station. The operation of area sources and electricity consumption required for operating the Merced Train Station are also considered.

Operational VMT Emissions

Emission Source [1]	Number of Round Trips per Day	Round Trip Distance (miles)	Emissions (tpy)							
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Operational Year 2035										
Employees [2]	32	40	0.004	0.301	0.021	0.002	0.018	0.010	176	0.003
Visitors by Shuttle / Bus [3]	20	40	0.005	0.125	0.130	0.004	0.013	0.008	367	0.002
Visitors by Car	6,688	40	0.807	62.912	4.440	0.377	3.660	2.099	36,746	0.673
2035 Total	**--**	**--**	**0.816**	**63.337**	**4.591**	**0.382**	**3.690**	**2.117**	**37,288**	**0.678**

Notes:
1. 304 visitors would arrive at the station via biking or walking which would not generate air emissions.
2. Assumed percentage of employees that carpool: 20%
3. 608 visitors travel by bus, but each bus is expected to hold 30 people (Lightbody, James/AECOM. Personal communication with Andrea White/CH2M HILL. July 22, 2010).

Vehicle Emission Factors

Vehicle Type	Vehicle Emission Factor (g/mile) [1]							
	ROG	CO	NOx	SOx	PM_{10} [2]	$PM_{2.5}$ [2]	CO_2	CH_4
Operational Year 2035								
Passenger	0.008	0.585	0.041	0.004	0.034	0.020	341.399	0.006
Shuttle / Bus [3]	0.014	0.382	0.398	0.011	0.040	0.024	1,124.221	0.005

Notes:
1. Emission factors are from EMFAC2007 (Version 2.3) for passenger vehicles (50% LDA-All and 50% of the average of LDT1-All and LDT2-All) and urban buses (UBUS-All) traveling at 35 mph.
2. Emission factors for PM_{10} and $PM_{2.5}$ include contributions from exhaust, brake-wear, and tire-wear.
3. The bus emission factors were determined using only 2023 - 2035 model years based on a 12-year usable life span for city buses (FTA, *Useful Life of Transit Buses and Vans* , April 2007).

Operational Area Source Emissions

Emission Source	Emissions (tpy) [1]						
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
Operational Year 2035							
Natural Gas Usage	0.010	0.120	0.150	0.000	0.000	0.000	176
Landscaping	0.010	0.140	0.000	0.000	0.000	0.000	0
2035 Total	**0.020**	**0.260**	**0.150**	**0.000**	**0.000**	**0.000**	**177**

Notes:
1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.

Operational Indirect Emissions

Emission Source	Building Size (sqft)	Electricity Usage Rate (kWh/sqft/year) [1]	Emissions (tpy)		
			CO_2	CH_4	N_2O
Operational Year 2035					
Station Buildings	105,600	13.55	487	0.020	0.004
2035 Total	**--**	**--**	**487**	**0.020**	**0.004**

Notes:
1. Electricity Usage Rate from Table A9-11-A (CEQA Handbook, 1993). The Station Buildings are considered 'Retail'.

Electricity Emission Factors

	Emission Factor (lb/MWh) [1, 2]		
	CO_2	CH_4	N_2O
Purchased Electricity	681.01	0.0283	0.00623

Notes:
1. Emission factors from U.S. EPA eGRID2010 Version 1.0 (2007 data) for the WECC California subregion.
2. Emission factors are not available for future years. As a result, the available emission factors were applied to 2035 operations.

C.1-4 Heavy Maintenance Facility: Onsite Operational Emissions

This tab estimates onsite emissions from operation of switch locomotives, diesel equipment, and diesel trucks within the Heavy Maintenance Facility rail yard.

Switch Locomotive Horsepower and Load Factors [1]

Notch	Horsepower	Percent Horsepower in Use	Percent Time in Notch	Actual Percent Time in Use	Engine Horsepower	Equivalent Horsepower Used in Analysis	Load Factors
Idle	13	0.3%	38.0%	100.0%	7	7	0.3%
Dynamic Brake	128	3.4%	12.5%	20.2%	68	14	--
1	211	5.6%	6.5%	10.5%	112	12	--
2	457	12.1%	6.5%	10.5%	242	25	--
3	928	24.6%	5.2%	8.4%	492	41	--
4	1,084	28.7%	4.4%	7.1%	575	41	--
5	1,666	44.2%	3.8%	6.1%	883	54	--
6	2,375	62.9%	3.9%	6.3%	1,259	79	--
7	3,182	84.3%	3.0%	4.8%	1,687	82	--
8	3,773	100.0%	16.2%	26.1%	2,000	523	--
Total for Moving Locomotives	--	--	100%	100%	--	877	44%

Notes:

1. Data was prepared by Parsons Brinckerhoff in July 2011 and was provided in a spreadsheet called "CA HMF All EmissionsR.xls".

Onsite Operational Emission Factors

HMF Operations	Mode	Average Number of Equipment	Engine Horespower	Load Factor (%) [1]	Emission Factors (g/bhp-hr)						
					ROG	CO	NOx	SOx [2, 3]	PM_{10}	$PM_{2.5}$	CO_2 [4]
Locomotive [5, 6, 7]	Idle	2	2,000	0.3%	0.08	1.83	1.3	0.006	0.03	0.03	672
	Moving	2	2,000	44.0%	0.08	1.83	1.3	0.006	0.03	0.03	672
Diesel Equipment [5, 6, 8, 9]	--	6	200	60.0%	0.14	2.6	0.3	0.2	0.015	0.015	1,756
Diesel Trucks [10, 11]	--	20	--	--	1.45	3.56	11.03	0.01	0.596	0.514	1,437

Notes:

1. Load factors for locomotives are weighted-average factors that were estimated for idling and moving modes based on in-use power at each notch setting (see Table AQ-1).
2. SOx emission factors for locomotives are based on the carbon content and fuel density.
3. SOx emission factor was obtained from "Technical Information and References", Table 2, Santa Barbara County Air Pollution Control District "Construction Equipment Controlled Emission Factors" (such as loaders, graders, dozers, etc.). These emission factors reflect usage of low (0.05%) sulfur content in the fuel (http://www.sbcapcd.org/eng/tech/apcd-24.htm).
4. CO_2 emission factors for locomotives are based on the carbon content and fuel density.
5. Number of trains operated in the yard (2), duration of operation in each mode, and number of pieces of diesel equipment (6) were provided by the project engineers. It is assumed that each locomotive will be continously moving and/or idling for 2 hours over each 24-hour period.
6. The horsepower of the switching train locomotive is assumed to be 2,000 hp; the horsepower of the diesel equipment was assumed to be 200 hp.
7. The locomotives will be purchased after 2015 and, therefore, will be subject to Tier 4 emission standards. PM Emission factors are the most stringent Tier 4 federal standards for switch locomotives that were introduced in May 2008 (73 FR 88 25098-25352, May 6, 2008) and are also povided in Table 4, Switch Locomotive Tier 4 Emission Standards from an online source (http://dieselnet.com/standards/us/).
8. Equipment emission factors are Tier 4 federal standards for on-road (off-road) diesel engines that were introduced in May 2004 (69 FR 38957-39273, 29 June, 2004) and are also provided in Table 3, Tier 4 Emission Standards for engines up to 560 kw from an online source (http://dieselnet.com/standards/us/).
9. Each piece of equipment was assumed to operate for 8 hours over each 24-hour period; the load factor for equipment was assumied to be 0.6.
10. PM emission factors are for the year 2017 for HDD vehicles from the EMFAC2007 model and are the sum of the running, tire wear, and break wear emissions and expressed in grams per mile. NOx, ROG, and CO emission factors are for the year 2017 for HDD vehicles from the EMFAC2007 model.
11. Number of delivery trucks and delivery truck operations were assumed to be 20 trucks per hour that will operate 8 hours over each 24-hour period.

Onsite Operational Emissions

HMF Operations	Mode	Emissions (lbs/year)							Emissions (tpy) [2]						
		ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$ [1]	CO_2	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
Locomotive	Idle	1.77	40.6	28.8	0.137	0.665	0.645	12,970	0.0009	0.0203	0.0144	0.0001	0.0003	0.0003	6.48
	Moving	226	5,170	3,670	17.5	84.7	82.2	3,094,354	0.113	2.59	1.84	0.0088	0.0424	0.0411	1,547
Diesel Equipment	--	649	12,100	1,390	927	69.5	67.4	8,133,277	0.325	6.05	0.695	0.464	0.0348	0.0337	4,067
Diesel Trucks	--	253	621	1,920	1.74	104	89.6	25,885,746	0.127	0.311	0.960	0.0009	0.0520	0.0448	12,943
Total	--	**1,130**	**17,932**	**7,009**	**946**	**259**	**240**	**37,126,346**	**0.565**	**8.97**	**3.50**	**0.473**	**0.129**	**0.120**	**18,563**

Notes:

1. Based on information provided by J. Soden, Parsons Brinckerhoff assumed that $PM_{2.5}$ emissions were 92 percent of the PM_{10} emissions for the locomotives and diesel equipment. This is captured in the emissions estimates and not in the emission factors provided.
2. Emissions (lbs/year) were converted to Emissions (tpy) using the following conversion: 2,000 lbs/ton

Operational emissions from electricity consumption were considered negligible for the Heavy Maintenance Facility and were, therefore, not estimated.

C.1-5 Heavy Maintenance Facility: Offsite Operational Emissions

This tab estimates operational emissions from employee commutes and deliveries to the Heavy Maintenance Facility.

Offsite Operational VMT Emissions

Emission Source [1]	Number of Round Trips per Day	Round Trip Distance (miles)	Emissions (tpy)							
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Operational Year 2035										
Employees [2]	1,200	40	0.145	11.288	0.797	0.068	0.657	0.377	6,593	0.121
Deliveries	20	120	0.065	0.513	0.779	0.005	0.042	0.024	501	0.003
2035 Total	**--**	**--**	**0.210**	**11.801**	**1.575**	**0.072**	**0.698**	**0.400**	**7,094**	**0.124**

Notes:

1. Onsite diesel-fueled vehicle emissions were included with the stationary source combustion calculations.
2. Assumed percentage of employees that carpool: 20%

Vehicle Emission Factors

Vehicle Type	Vehicle Emission Factor (g/mile)							
	ROG	CO	NOx	SOx	PM_{10} [2]	$PM_{2.5}$ [2]	CO_2	CH_4
Operational Year 2035								
Passenger [1]	0.008	0.585	0.041	0.004	0.034	0.020	341.399	0.006
Delivery Truck [1]	0.067	0.532	0.807	0.005	0.043	0.025	519.115	0.003

Notes:

1. Emission factors are from EMFAC2007 (Version 2.3) for passenger vehicles (50% LDA-All and 50% of the average of LDT1-All and LDT2-All) and delivery trucks (average of LHD1-DSL and LHD2-DSL) traveling at 35 mph.
2. Emission factors for PM_{10} and $PM_{2.5}$ include contributions from exhaust, brake-wear, and tire-wear.

C.1-6 Overnight Layover / Servicing Facility: Operational Emissions

This tab estimates operational emissions from employee commutes to the Overnight Layover / Servicing Facility.

Operational VMT Emissions

Emission Source	Number of Round Trips per Day	Round Trip Distance (miles)	Emissions (tpy)							
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Operational Year 2035										
Employees [1]	32	40	0.004	0.301	0.021	0.002	0.018	0.010	176	0.003
2035 Total	**--**	**--**	**0.004**	**0.301**	**0.021**	**0.002**	**0.018**	**0.010**	**176**	**0.003**

Notes:

1. Assumed percentage of employees that carpool: 20%

Vehicle Emission Factors

Vehicle Type	Vehicle Emission Factor (g/mile) [1]							
	ROG	CO	NOx	SOx	PM_{10} [2]	$PM_{2.5}$ [2]	CO_2	CH_4
Operational Year 2035								
Passenger	0.008	0.585	0.041	0.004	0.034	0.020	341.399	0.006

Notes:

1. Emission factors are from EMFAC2007 (Version 2.3) for passenger vehicles (50% LDA-All and 50% of the average of LDT1-All and LDT2-All) traveling at 35 mph.
2. Emission factors for PM_{10} and $PM_{2.5}$ include contributions from exhaust, brake-wear, and tire-wear.

Operational emissions from electricity consumption were considered negligible for the Overnight Layover / Servicing Facility and were, therefore, not estimated.
There are no stationary sources associated with the Overnight Layover / Servicing Facility. As a result, stationary source emissions were not estimated.

C.1-7 Train Dust Wake: Fugitive Dust Emissions

This tab estimates fugitive dust emissoins resulting from operation of the HST and maintenance trips along the length of the alignment.

Train Velocity	97.0 m/s	217 mph
	98.3 m/s	220 mph

$P = 58(u^* - ut^*)^2 + 25(u^* - ut^*)$

$P = 0$ for $u^* < ut^*$

$ut^* =$ 0.19 m/s

u* = Friction Velocity for the Fastest Mile (m/s)

ut* = Threshold friction velocity (m/s), 0.5 m/s (lowest number from AP42, for coal pile)

0.19 m/s based on the lowest value for disturbed desert soil

Wind speed Profile

$$u = (1.2319)^{0.072v-4} \times (0.4575\,d^2 - 3.5496\,d + 9.1545)$$

Where:

u: the maximum wind velocity around human body near the train (m/s).

d: human-train distance (m).

v: train running speed (m/s).

EF (per event) = k x P

k is a particle size multiplier

k = 0.5 for particles < 10 um

k = 0.075 for particles < 2.5 um

$u(z) = (u^*/0.4)\ln(z/zo)$

z = 288 cm

z0 = 0.01 cm

u(z) = wind speed at a certain height above the surface (cm/s)

u* = friction velocity for fastest mile. Based on disturbed desert soils (DRI Study)

z = height above the surface (288 cm), based on 1/2 of the train height (1.88 m) & embankment height (1m)

zo = surface roughness height (cm), assume 0.01 cm for the at grade right of way

0.4 is von Karman's constant, dimensionless

Train-Object Distance	Wind Speed from 217 mph Train	Wind Speed from 220 mph Train	Friction Velocity	Erosion Potential	Emission Factor	
(m)	u (m/s)		u* (m/s)	P (g/m^2)	PM_{10} (g/m^2)	$PM_{2.5}$ (g/m^2)
1	11.30	11.53	0.45	10.37	5.18	0.78
1.1	10.81	11.03	0.43	9.33	4.67	0.70
1.2	10.35	10.56	0.41	8.38	4.19	0.63
1.3	9.90	10.10	0.39	7.49	3.75	0.56
1.4	9.47	9.66	0.38	6.68	3.34	0.50
1.5	9.06	9.24	0.36	5.92	2.96	0.44
1.6	8.66	8.83	0.34	5.23	2.62	0.39
1.7	8.28	8.45	0.33	4.60	2.30	0.34
1.8	7.92	8.08	0.31	4.02	2.01	0.30
1.9	7.57	7.72	0.30	3.48	1.74	0.26
2	7.24	7.39	0.29	3.00	1.50	0.22
2.1	6.93	7.07	0.28	2.56	1.28	0.19
2.2	6.63	6.77	0.26	2.16	1.08	0.16
2.3	6.36	6.48	0.25	1.79	0.90	0.13
2.4	6.09	6.22	0.24	1.46	0.73	0.11
2.5	5.85	5.97	0.23	1.17	0.58	0.09
2.6	5.62	5.74	0.22	0.90	0.45	0.07
2.7	5.41	5.53	0.22	0.67	0.33	0.05
2.8	5.22	5.33	0.21	0.46	0.23	0.03
2.9	5.05	5.15	0.20	0.27	0.14	0.02
3	4.89	4.99	0.19	0.11	0.05	0.01
3.07	4.79	4.88	0.19	0.01	0.00	0.00

PM_{10} Emissions	$PM_{2.5}$ Emissions	Emissions Units
3.74	0.56	grams/meter traveled
6023.03	903.45	grams/VMT (one side)
26.53	3.98	lb/miles (both sides)
21.613	3.242	Tpy (24 disturbances)

Note:

Annual emissions determined by scaling emissions by 67.88 miles (the length of the at-grade rail for the BNSF Ave 24 Alternative). This Alternative had the longest possible at-grade length.

Fugitive dust emissions are only expected as a result of train movement along the at-grade track since the dust would be kicked up from the surrounding embankment.

C.1-8 Regional Emissions: Vehicle Miles Traveled

This tab estimates operational emissions from regional vehicle miles traveled; the values reflect the difference in vehicle miles traveled as a result of building the High Speed Train.

County	Daily Emissions (tons/day)							Annual Emissions (tpy) [1]						
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
No Project - Year 2009 [2]														
Fresno County	5	89	54	0	2	2	12,699	1,825	32,485	19,710	0	730	730	4,635,135
Madera County	1	19	11	0	0	0	2,361	365	6,935	4,015	0	0	0	861,765
Merced County	2	32	27	0	1	1	4,612	730	11,680	9,855	0	365	365	1,683,380
Total	**8**	**140**	**92**	**0**	**3**	**3**	**19,672**	**2,920**	**51,100**	**33,580**	**0**	**1,095**	**1,095**	**7,180,280**
No Project - Operational Year 2035 [3]														
Fresno County	1	24	8	0	1	1	13,985	458	8,838	2,764	50	480	287	5,104,505
Madera County	0	8	3	0	0	0	4,507	172	2,980	1,000	15	157	99	1,644,975
Merced County	1	12	4	0	1	0	7,136	253	4,560	1,614	25	252	151	2,604,706
Total	**2**	**45**	**15**	**0**	**2**	**1**	**25,628**	**883**	**16,378**	**5,378**	**90**	**889**	**537**	**9,354,185**
Full Build of Project - Operational Year 2035 [3]														
Fresno County	1	22	7	0	1	1	12,552	411	7,872	2,504	45	430	258	4,581,505
Madera County	0	8	3	0	0	0	4,374	168	2,893	976	15	153	96	1,596,641
Merced County	1	11	4	0	1	0	6,415	229	4,081	1,482	23	227	136	2,341,333
Total	**2**	**41**	**14**	**0**	**2**	**1**	**23,341**	**807**	**14,846**	**4,963**	**83**	**810**	**490**	**8,519,478**

Notes:

1. Assumed 365 days of regional traffic to compute the annual emissions from the daily emissions.

2. Daily emissions for the No Project - Year 2009 provided by A. Lovegrove of the Project Management Team to A. White (2/14/11); correspondence documented in FW: HST Air Quality Vehicle Emissions.msg.

3. Daily emissions for the No Project - Operational Year 2035 and Full Build of Project - Operational Year 2035 calculated by the Project Management Team in 02-14-11 statewide burdens.xlsx, as provided by A. Lovegrove to A. White (2/14/11).

C.1-9 Statewide Emissions: Vehicle Miles Traveled

This tab estimates operational emissions from statewide vehicle miles traveled; the values reflect the difference in vehicle miles traveled as a result of building the High Speed Train.

	No Project		Full Build		Total No Build Emission Burden (tons/				
County	Intraregional Traffic	Interregional Traffic	Intraregional Traffic	Interregional Traffic	HC	CO	NOx	CO_2	SO_2
Alameda County	38,222,605	5,972,890	38,220,010	5,331,919	2.06	42.15	10.02	23,799	0.24
Alpine County	1,347,851	56,094	1,347,851	53,366	0.10	1.42	0.92	1,086	0.01
Amador County	4,107,029	553,991	4,107,029	539,799	0.26	4.67	0.74	1,976	0.02
Calaveras County	791,000	623,870	791,000	592,696	0.07	1.35	0.27	651	0.01
Contra Costa County	25,118,332	2,749,555	25,118,279	2,548,722	1.31	27.70	4.60	14,028	0.13
El Dorado County	8,990,386	414,970	8,990,386	389,345	0.44	8.56	1.19	4,154	0.04
Fresno County	14,091,970	13,275,979	14,091,970	10,272,315	1.25	24.21	7.57	13,985	0.14
Imperial County	11,572,109	615,583	11,560,757	609,415	1.25	19.73	8.97	8,339	0.08
Inyo County	4,599,805	579,151	4,599,805	559,096	0.34	5.51	1.68	2,734	0.03
Kern County	23,107,031	16,133,071	23,103,717	12,045,485	2.52	39.72	17.08	23,840	0.22
Kings County	1,352,741	1,783,979	1,352,741	1,310,372	0.18	3.05	1.29	1,827	0.02
Los Angeles County	249,400,317	16,160,002	247,129,828	12,568,662	10.70	247.37	53.40	134,008	1.19
Madera County	4,120,611	4,411,941	4,120,611	4,135,780	0.47	8.16	2.74	4,507	0.04
Marin County	7,506,605	455,025	7,506,600	360,137	0.37	7.60	1.47	4,096	0.04
Mariposa County	156,500	716,961	156,500	689,509	0.04	0.80	0.19	409	0.00
Merced County	4,172,211	9,362,159	4,163,142	7,855,311	0.69	12.49	4.42	7,136	0.07
Mono County	1,144,776	233,836	1,144,776	220,576	0.10	1.56	0.52	826	0.01
Monterey County	5,952,226	7,912,357	5,952,226	7,170,802	0.64	13.07	3.09	6,381	0.06
Napa County	3,605,674	1,233,028	3,605,674	1,186,972	0.26	5.15	0.90	2,730	0.03
Nevada County	5,797,940	1,850,290	5,797,940	1,777,745	0.41	7.15	2.00	3,818	0.03
Orange County	86,740,066	7,815,887	86,254,585	6,444,443	3.25	84.84	14.91	45,109	0.43
Placer County	9,998,119	2,359,851	9,998,119	2,214,214	0.65	11.76	2.98	6,250	0.05
Riverside County	95,925,053	5,361,861	95,310,335	4,491,144	5.23	100.37	30.34	58,511	0.56
Sacramento County	25,305,043	8,127,687	25,276,755	7,477,837	1.28	28.50	5.67	15,166	0.15
San Benito County	521,692	2,839,712	520,533	2,448,062	0.17	3.09	0.92	1,667	0.02
San Bernardino County	94,185,063	2,540,941	93,618,352	2,090,807	5.31	93.17	33.74	56,799	0.53
San Diego County	144,554,023	13,719,957	144,548,500	11,729,790	9.13	183.51	37.33	74,988	0.71
San Francisco County	10,204,563	352,678	10,109,396	304,409	0.62	10.79	2.51	6,143	0.06
San Joaquin County	8,602,454	14,115,259	8,568,383	12,629,866	1.04	19.81	5.73	11,039	0.10
San Luis Obispo County	3,377,987	5,033,257	3,377,937	4,562,852	0.39	7.32	1.67	3,844	0.04
San Mateo County	23,080,831	1,137,816	22,834,303	969,987	0.92	21.97	3.07	10,939	0.11
Santa Barbara County	3,675,376	4,418,706	3,675,376	3,917,182	0.35	7.24	1.63	3,620	0.04
Santa Clara County	43,327,579	7,536,024	43,209,663	6,746,484	2.13	47.46	7.81	25,017	0.23
Santa Cruz County	1,568,289	1,032,323	1,567,510	996,792	0.12	2.51	0.48	1,173	0.01
Solano County	11,620,349	4,480,693	11,620,349	4,308,566	0.93	16.95	4.55	8,799	0.09
Sonoma County	11,242,559	1,495,946	11,242,559	1,408,920	0.66	13.07	2.00	6,688	0.07
Stanislaus County	4,468,934	7,009,046	4,462,100	6,018,627	0.53	10.20	2.91	5,741	0.06
Sutter County	2,627,534	1,250,886	2,627,534	1,200,940	0.19	3.28	1.16	2,136	0.02

Tulare County	4,949,520	5,162,491	4,949,520	4,698,860	0.49	9.64	1.94	4,727	0.04
Tuolumne County	1,061,851	704,858	1,061,851	672,678	0.09	1.81	0.34	863	0.01
Ventura County	23,052,919	3,582,886	22,950,834	3,401,970	1.05	25.78	4.04	14,164	0.15
Yolo County	3,574,531	4,283,723	3,571,768	4,089,822	0.35	6.84	1.72	3,688	0.03
Yuba County	1,539,292	667,915	1,539,292	646,109	0.09	1.89	0.35	978	0.01
Rest CA (North of Bay Area/Sacramento)	23,861,125	10,256,688	23,859,192	10,027,004	1.73	31.29	7.40	15,973	0.15
Statewide Total	**1,054,222,473**	**200,381,820**	**1,049,615,590**	**173,715,386**	**60.13**	**1,224.50**	**298.26**	**644,351**	**6.06**

Notes:

1. Assumed 365 days of statewide traffic to compute the annual emissions from the daily emissions.

C.1-9 Statewide Emissions: Vehicle Miles Traveled

This tab estimates operational emissions from statewide vehicle miles traveled; the values reflect the difference in vehicle miles traveled as a result of building the High Speed Train.

	No Project		Full Build		day)		Total Build Emission Bu			
County	Intraregional Traffic	Interregional Traffic	Intraregional Traffic	Interregional Traffic	PM_{10}	$PM_{2.5}$	HC	CO	NOx	CO_2
Alameda County	38,222,605	5,972,890	38,220,010	5,331,919	2.12	1.33	2.02	41.49	9.84	23,429
Alpine County	1,347,851	56,094	1,347,851	53,366	0.09	0.06	0.10	1.41	0.91	1,084
Amador County	4,107,029	553,991	4,107,029	539,799	0.17	0.10	0.26	4.66	0.74	1,969
Calaveras County	791,000	623,870	791,000	592,696	0.06	0.03	0.07	1.32	0.26	636
Contra Costa County	25,118,332	2,749,555	25,118,279	2,548,722	1.28	0.78	1.30	27.49	4.55	13,912
El Dorado County	8,990,386	414,970	8,990,386	389,345	0.36	0.20	0.43	8.53	1.19	4,141
Fresno County	14,091,970	13,275,979	14,091,970	10,272,315	1.31	0.79	1.13	21.57	6.86	12,552
Imperial County	11,572,109	615,583	11,560,757	609,415	0.82	0.51	1.25	19.71	8.96	8,328
Inyo County	4,599,805	579,151	4,599,805	559,096	0.25	0.15	0.34	5.50	1.68	2,725
Kern County	23,107,031	16,133,071	23,103,717	12,045,485	2.18	1.34	2.34	36.07	16.10	21,869
Kings County	1,352,741	1,783,979	1,352,741	1,310,372	0.18	0.11	0.16	2.64	1.17	1,598
Los Angeles County	249,400,317	16,160,002	247,129,828	12,568,662	12.61	7.90	10.43	241.73	52.02	130,953
Madera County	4,120,611	4,411,941	4,120,611	4,135,780	0.43	0.27	0.46	7.93	2.67	4,374
Marin County	7,506,605	455,025	7,506,600	360,137	0.35	0.21	0.36	7.50	1.44	4,040
Mariposa County	156,500	716,961	156,500	689,509	0.04	0.02	0.04	0.77	0.19	395
Merced County	4,172,211	9,362,159	4,163,142	7,855,311	0.69	0.41	0.63	11.18	4.06	6,415
Mono County	1,144,776	233,836	1,144,776	220,576	0.07	0.05	0.10	1.55	0.51	819
Monterey County	5,952,226	7,912,357	5,952,226	7,170,802	0.63	0.37	0.60	12.42	2.91	6,029
Napa County	3,605,674	1,233,028	3,605,674	1,186,972	0.24	0.15	0.26	5.10	0.88	2,702
Nevada County	5,797,940	1,850,290	5,797,940	1,777,745	0.34	0.20	0.40	7.09	1.98	3,783
Orange County	86,740,066	7,815,887	86,254,585	6,444,443	4.29	2.52	3.16	83.08	14.48	44,160
Placer County	9,998,119	2,359,851	9,998,119	2,214,214	0.56	0.33	0.64	11.63	2.94	6,177
Riverside County	95,925,053	5,361,861	95,310,335	4,491,144	5.33	3.33	5.16	98.91	29.94	57,697
Sacramento County	25,305,043	8,127,687	25,276,755	7,477,837	1.40	0.80	1.25	27.88	5.51	14,836
San Benito County	521,692	2,839,712	520,533	2,448,062	0.16	0.09	0.15	2.74	0.82	1,480
San Bernardino County	94,185,063	2,540,941	93,618,352	2,090,807	5.10	3.08	5.25	92.21	33.43	56,243
San Diego County	144,554,023	13,719,957	144,548,500	11,729,790	7.68	4.71	9.03	181.55	36.82	73,925
San Francisco County	10,204,563	352,678	10,109,396	304,409	0.54	0.34	0.61	10.64	2.48	6,055
San Joaquin County	8,602,454	14,115,259	8,568,383	12,629,866	1.05	0.63	0.97	18.49	5.37	10,315
San Luis Obispo County	3,377,987	5,033,257	3,377,937	4,562,852	0.36	0.21	0.37	6.91	1.56	3,618
San Mateo County	23,080,831	1,137,816	22,834,303	969,987	1.05	0.62	0.91	21.58	3.00	10,738
Santa Barbara County	3,675,376	4,418,706	3,675,376	3,917,182	0.35	0.20	0.33	6.80	1.52	3,382
Santa Clara County	43,327,579	7,536,024	43,209,663	6,746,484	2.24	1.34	2.08	46.54	7.58	24,515
Santa Cruz County	1,568,289	1,032,323	1,567,510	996,792	0.11	0.06	0.12	2.47	0.47	1,155
Solano County	11,620,349	4,480,693	11,620,349	4,308,566	0.82	0.52	0.92	16.78	4.50	8,704
Sonoma County	11,242,559	1,495,946	11,242,559	1,408,920	0.59	0.36	0.65	12.98	1.98	6,637
Stanislaus County	4,468,934	7,009,046	4,462,100	6,018,627	0.52	0.31	0.49	9.31	2.67	5,260
Sutter County	2,627,534	1,250,886	2,627,534	1,200,940	0.18	0.11	0.18	3.24	1.14	2,112

Tulare County	4,949,520	5,162,491	4,949,520	4,698,860	0.46	0.28	0.47	9.24	1.83	4,506
Tuolumne County	1,061,851	704,858	1,061,851	672,678	0.08	0.04	0.09	1.77	0.33	845
Ventura County	23,052,919	3,582,886	22,950,834	3,401,970	1.16	0.72	1.04	25.50	3.98	14,012
Yolo County	3,574,531	4,283,723	3,571,768	4,089,822	0.35	0.21	0.35	6.67	1.67	3,594
Yuba County	1,539,292	667,915	1,539,292	646,109	0.09	0.05	0.09	1.87	0.35	968
Rest CA (North of Bay Area/Sacramento)	23,861,125	10,256,688	23,859,192	10,027,004	1.44	0.84	1.72	31.09	7.35	15,862
Statewide Total	**1,054,222,473**	**200,381,820**	**1,049,615,590**	**173,715,386**	**60.12**	**36.68**	**59**	**1,196**	**291**	**628,552**

Notes:

1. Assumed 365 days of statewide traffic to compute the annual emissions from the daily emissions.

C.1-9 Statewide Emissions: Vehicle Miles Traveled

This tab estimates operational emissions from statewide vehicle miles traveled; the values reflect the difference in vehicle miles traveled as a result of building the High Speed Train.

County	No Project		Full Build		den (tons/day)		
	Intraregional Traffic	Interregional Traffic	Intraregional Traffic	Interregional Traffic	SO_2	PM_{10}	$PM_{2.5}$
Alameda County	38,222,605	5,972,890	38,220,010	5,331,919	0.24	2.09	1.31
Alpine County	1,347,851	56,094	1,347,851	53,366	0.01	0.09	0.06
Amador County	4,107,029	553,991	4,107,029	539,799	0.02	0.17	0.10
Calaveras County	791,000	623,870	791,000	592,696	0.01	0.06	0.03
Contra Costa County	25,118,332	2,749,555	25,118,279	2,548,722	0.12	1.27	0.77
El Dorado County	8,990,386	414,970	8,990,386	389,345	0.04	0.35	0.20
Fresno County	14,091,970	13,275,979	14,091,970	10,272,315	0.12	1.18	0.71
Imperial County	11,572,109	615,583	11,560,757	609,415	0.08	0.82	0.51
Inyo County	4,599,805	579,151	4,599,805	559,096	0.03	0.25	0.15
Kern County	23,107,031	16,133,071	23,103,717	12,045,485	0.21	2.00	1.24
Kings County	1,352,741	1,783,979	1,352,741	1,310,372	0.01	0.15	0.10
Los Angeles County	249,400,317	16,160,002	247,129,828	12,568,662	1.16	12.32	7.73
Madera County	4,120,611	4,411,941	4,120,611	4,135,780	0.04	0.42	0.26
Marin County	7,506,605	455,025	7,506,600	360,137	0.04	0.35	0.21
Mariposa County	156,500	716,961	156,500	689,509	0.00	0.04	0.02
Merced County	4,172,211	9,362,159	4,163,142	7,855,311	0.06	0.62	0.37
Mono County	1,144,776	233,836	1,144,776	220,576	0.01	0.07	0.05
Monterey County	5,952,226	7,912,357	5,952,226	7,170,802	0.06	0.59	0.35
Napa County	3,605,674	1,233,028	3,605,674	1,186,972	0.03	0.24	0.15
Nevada County	5,797,940	1,850,290	5,797,940	1,777,745	0.03	0.34	0.19
Orange County	86,740,066	7,815,887	86,254,585	6,444,443	0.42	4.20	2.47
Placer County	9,998,119	2,359,851	9,998,119	2,214,214	0.05	0.55	0.33
Riverside County	95,925,053	5,361,861	95,310,335	4,491,144	0.55	5.26	3.28
Sacramento County	25,305,043	8,127,687	25,276,755	7,477,837	0.14	1.37	0.78
San Benito County	521,692	2,839,712	520,533	2,448,062	0.01	0.14	0.08
San Bernardino County	94,185,063	2,540,941	93,618,352	2,090,807	0.53	5.05	3.05
San Diego County	144,554,023	13,719,957	144,548,500	11,729,790	0.70	7.58	4.65
San Francisco County	10,204,563	352,678	10,109,396	304,409	0.06	0.53	0.33
San Joaquin County	8,602,454	14,115,259	8,568,383	12,629,866	0.09	0.98	0.58
San Luis Obispo County	3,377,987	5,033,257	3,377,937	4,562,852	0.04	0.34	0.20
San Mateo County	23,080,831	1,137,816	22,834,303	969,987	0.11	1.03	0.61
Santa Barbara County	3,675,376	4,418,706	3,675,376	3,917,182	0.03	0.32	0.19
Santa Clara County	43,327,579	7,536,024	43,209,663	6,746,484	0.23	2.20	1.31
Santa Cruz County	1,568,289	1,032,323	1,567,510	996,792	0.01	0.11	0.06
Solano County	11,620,349	4,480,693	11,620,349	4,308,566	0.09	0.82	0.52
Sonoma County	11,242,559	1,495,946	11,242,559	1,408,920	0.07	0.58	0.36
Stanislaus County	4,468,934	7,009,046	4,462,100	6,018,627	0.05	0.48	0.28
Sutter County	2,627,534	1,250,886	2,627,534	1,200,940	0.02	0.18	0.11

Tulare County	4,949,520	5,162,491	4,949,520	4,698,860	0.04	0.44	0.27
Tuolumne County	1,061,851	704,858	1,061,851	672,678	0.01	0.07	0.04
Ventura County	23,052,919	3,582,886	22,950,834	3,401,970	0.15	1.15	0.71
Yolo County	3,574,531	4,283,723	3,571,768	4,089,822	0.03	0.34	0.20
Yuba County	1,539,292	667,915	1,539,292	646,109	0.01	0.09	0.05
Rest CA (North of Bay Area/Sacramento)	23,861,125	10,256,688	23,859,192	10,027,004	0.15	1.43	0.83
Statewide Total	**1,054,222,473**	**200,381,820**	**1,049,615,590**	**173,715,386**	**6**	**59**	**36**

Notes:

1. Assumed 365 days of statewide traffic to compute the annual emissions from the daily emissions.

C.1-9 Statewide Emissions: Vehicle Miles Traveled

This tab estimates operational emissions from statewide vehicle miles traveled; the values reflect the difference in vehicle miles traveled as a result of building the High Speed Train.

County	No Project		Full Build		Change in Emission Burden with Project (Tons/Day)					
	Intraregional Traffic	Interregional Traffic	Intraregional Traffic	Interregional Traffic	HC	CO	NOx	CO_2	SO_2	PM_{10}
Alameda County	38,222,605	5,972,890	38,220,010	5,331,919	-0.04	-0.67	-0.18	-370	0.00	-0.03
Alpine County	1,347,851	56,094	1,347,851	53,366	0.00	0.00	0.00	-1	0.00	0.00
Amador County	4,107,029	553,991	4,107,029	539,799	0.00	-0.01	0.00	-7	0.00	0.00
Calaveras County	791,000	623,870	791,000	592,696	0.00	-0.03	-0.01	-15	0.00	0.00
Contra Costa County	25,118,332	2,749,555	25,118,279	2,548,722	-0.01	-0.21	-0.05	-116	0.00	-0.01
El Dorado County	8,990,386	414,970	8,990,386	389,345	0.00	-0.02	-0.01	-13	0.00	0.00
Fresno County	14,091,970	13,275,979	14,091,970	10,272,315	-0.13	-2.65	-0.71	-1,433	-0.01	-0.14
Imperial County	11,572,109	615,583	11,560,757	609,415	0.00	-0.02	-0.01	-11	0.00	0.00
Inyo County	4,599,805	579,151	4,599,805	559,096	0.00	-0.02	0.00	-10	0.00	0.00
Kern County	23,107,031	16,133,071	23,103,717	12,045,485	-0.18	-3.65	-0.98	-1,971	-0.02	-0.18
Kings County	1,352,741	1,783,979	1,352,741	1,310,372	-0.02	-0.41	-0.11	-228	0.00	-0.02
Los Angeles County	249,400,317	16,160,002	247,129,828	12,568,662	-0.27	-5.64	-1.38	-3,056	-0.03	-0.28
Madera County	4,120,611	4,411,941	4,120,611	4,135,780	-0.01	-0.24	-0.07	-132	0.00	-0.01
Marin County	7,506,605	455,025	7,506,600	360,137	-0.01	-0.10	-0.03	-56	0.00	0.00
Mariposa County	156,500	716,961	156,500	689,509	0.00	-0.02	-0.01	-13	0.00	0.00
Merced County	4,172,211	9,362,159	4,163,142	7,855,311	-0.07	-1.31	-0.36	-722	-0.01	-0.07
Mono County	1,144,776	233,836	1,144,776	220,576	0.00	-0.01	0.00	-7	0.00	0.00
Monterey County	5,952,226	7,912,357	5,952,226	7,170,802	-0.03	-0.65	-0.17	-352	0.00	-0.03
Napa County	3,605,674	1,233,028	3,605,674	1,186,972	0.00	-0.05	-0.01	-28	0.00	0.00
Nevada County	5,797,940	1,850,290	5,797,940	1,777,745	0.00	-0.06	-0.02	-35	0.00	0.00
Orange County	86,740,066	7,815,887	86,254,585	6,444,443	-0.08	-1.76	-0.42	-949	-0.01	-0.09
Placer County	9,998,119	2,359,851	9,998,119	2,214,214	-0.01	-0.14	-0.04	-73	0.00	-0.01
Riverside County	95,925,053	5,361,861	95,310,335	4,491,144	-0.07	-1.45	-0.41	-814	-0.01	-0.07
Sacramento County	25,305,043	8,127,687	25,276,755	7,477,837	-0.03	-0.61	-0.16	-330	0.00	-0.03
San Benito County	521,692	2,839,712	520,533	2,448,062	-0.02	-0.34	-0.09	-187	0.00	-0.02
San Bernardino County	94,185,063	2,540,941	93,618,352	2,090,807	-0.05	-0.96	-0.31	-556	-0.01	-0.05
San Diego County	144,554,023	13,719,957	144,548,500	11,729,790	-0.10	-1.96	-0.52	-1,063	-0.01	-0.10
San Francisco County	10,204,563	352,678	10,109,396	304,409	-0.01	-0.15	-0.04	-87	0.00	-0.01
San Joaquin County	8,602,454	14,115,259	8,568,383	12,629,866	-0.07	-1.31	-0.36	-724	-0.01	-0.07
San Luis Obispo County	3,377,987	5,033,257	3,377,937	4,562,852	-0.02	-0.41	-0.11	-226	0.00	-0.02
San Mateo County	23,080,831	1,137,816	22,834,303	969,987	-0.02	-0.39	-0.07	-201	0.00	-0.02
Santa Barbara County	3,675,376	4,418,706	3,675,376	3,917,182	-0.02	-0.44	-0.12	-238	0.00	-0.02
Santa Clara County	43,327,579	7,536,024	43,209,663	6,746,484	-0.05	-0.92	-0.23	-501	0.00	-0.05
Santa Cruz County	1,568,289	1,032,323	1,567,510	996,792	0.00	-0.03	-0.01	-18	0.00	0.00
Solano County	11,620,349	4,480,693	11,620,349	4,308,566	-0.01	-0.17	-0.05	-95	0.00	-0.01
Sonoma County	11,242,559	1,495,946	11,242,559	1,408,920	0.00	-0.09	-0.02	-51	0.00	0.00
Stanislaus County	4,468,934	7,009,046	4,462,100	6,018,627	-0.04	-0.89	-0.24	-481	0.00	-0.05
Sutter County	2,627,534	1,250,886	2,627,534	1,200,940	0.00	-0.04	-0.01	-24	0.00	0.00

Tulare County	4,949,520	5,162,491	4,949,520	4,698,860	-0.02	-0.40	-0.11	-221	0.00	-0.02
Tuolumne County	1,061,851	704,858	1,061,851	672,678	0.00	-0.03	-0.01	-17	0.00	0.00
Ventura County	23,052,919	3,582,886	22,950,834	3,401,970	-0.01	-0.28	-0.06	-152	0.00	-0.01
Yolo County	3,574,531	4,283,723	3,571,768	4,089,822	-0.01	-0.17	-0.05	-93	0.00	-0.01
Yuba County	1,539,292	667,915	1,539,292	646,109	0.00	-0.02	-0.01	-11	0.00	0.00
Rest CA (North of Bay Area/Sacramento)	23,861,125	10,256,688	23,859,192	10,027,004	-0.01	-0.20	-0.05	-111	0.00	-0.01
Statewide Total	**1,054,222,473**	**200,381,820**	**1,049,615,590**	**173,715,386**	**(1)**	**(29)**	**(8)**	**(15,799)**	**(0)**	**(1)**

Notes:

1. Assumed 365 days of statewide traffic to compute the annual emissions from the daily emissions.

C.1-9 Statewide Emissions: Vehicle Miles Traveled

This tab estimates operational emissions from statewide vehicle miles traveled; the values reflect the difference in vehicle miles traveled as a result of building the High Speed Train.

	No Project		Full Build			Change in Emission		
County	Intraregional Traffic	Interregional Traffic	Intraregional Traffic	Interregional Traffic	$PM_{2.5}$	HC	CO	NOx
Alameda County	38,222,605	5,972,890	38,220,010	5,331,919	-0.02	-12.94	-244.34	-64.16
Alpine County	1,347,851	56,094	1,347,851	53,366	0.00	-0.04	-0.88	-0.24
Amador County	4,107,029	553,991	4,107,029	539,799	0.00	-0.23	-4.59	-1.23
Calaveras County	791,000	623,870	791,000	592,696	0.00	-0.50	-10.34	-2.75
Contra Costa County	25,118,332	2,749,555	25,118,279	2,548,722	-0.01	-4.04	-76.30	-20.04
El Dorado County	8,990,386	414,970	8,990,386	389,345	0.00	-0.44	-8.86	-2.34
Fresno County	14,091,970	13,275,979	14,091,970	10,272,315	-0.08	-47.13	-965.60	-259.83
Imperial County	11,572,109	615,583	11,560,757	609,415	0.00	-0.54	-8.88	-3.70
Inyo County	4,599,805	579,151	4,599,805	559,096	0.00	-0.33	-6.32	-1.73
Kern County	23,107,031	16,133,071	23,103,717	12,045,485	-0.11	-65.88	-1,333.46	-357.57
Kings County	1,352,741	1,783,979	1,352,741	1,310,372	-0.01	-7.81	-149.39	-41.16
Los Angeles County	249,400,317	16,160,002	247,129,828	12,568,662	-0.17	-97.91	-2,058.08	-503.08
Madera County	4,120,611	4,411,941	4,120,611	4,135,780	-0.01	-4.56	-87.00	-23.89
Marin County	7,506,605	455,025	7,506,600	360,137	0.00	-1.99	-36.58	-9.62
Mariposa County	156,500	716,961	156,500	689,509	0.00	-0.44	-8.95	-2.40
Merced County	4,172,211	9,362,159	4,163,142	7,855,311	-0.04	-24.47	-479.41	-131.50
Mono County	1,144,776	233,836	1,144,776	220,576	0.00	-0.25	-4.34	-1.22
Monterey County	5,952,226	7,912,357	5,952,226	7,170,802	-0.02	-11.64	-236.00	-63.85
Napa County	3,605,674	1,233,028	3,605,674	1,186,972	0.00	-1.02	-18.34	-4.82
Nevada County	5,797,940	1,850,290	5,797,940	1,777,745	0.00	-1.14	-23.32	-6.28
Orange County	86,740,066	7,815,887	86,254,585	6,444,443	-0.05	-30.14	-643.40	-154.39
Placer County	9,998,119	2,359,851	9,998,119	2,214,214	0.00	-2.46	-49.75	-13.18
Riverside County	95,925,053	5,361,861	95,310,335	4,491,144	-0.05	-27.04	-530.88	-149.04
Sacramento County	25,305,043	8,127,687	25,276,755	7,477,837	-0.02	-10.83	-224.06	-58.77
San Benito County	521,692	2,839,712	520,533	2,448,062	-0.01	-6.34	-124.21	-33.92
San Bernardino County	94,185,063	2,540,941	93,618,352	2,090,807	-0.03	-18.83	-350.19	-112.76
San Diego County	144,554,023	13,719,957	144,548,500	11,729,790	-0.06	-36.15	-716.62	-188.64
San Francisco County	10,204,563	352,678	10,109,396	304,409	0.00	-3.23	-55.60	-13.53
San Joaquin County	8,602,454	14,115,259	8,568,383	12,629,866	-0.04	-24.51	-478.97	-131.36
San Luis Obispo County	3,377,987	5,033,257	3,377,937	4,562,852	-0.01	-7.76	-148.21	-40.69
San Mateo County	23,080,831	1,137,816	22,834,303	969,987	-0.01	-6.55	-142.28	-26.88
Santa Barbara County	3,675,376	4,418,706	3,675,376	3,917,182	-0.01	-7.87	-159.61	-43.18
Santa Clara County	43,327,579	7,536,024	43,209,663	6,746,484	-0.03	-17.27	-334.90	-83.25
Santa Cruz County	1,568,289	1,032,323	1,567,510	996,792	0.00	-0.60	-12.29	-3.23
Solano County	11,620,349	4,480,693	11,620,349	4,308,566	-0.01	-3.32	-63.44	-16.69
Sonoma County	11,242,559	1,495,946	11,242,559	1,408,920	0.00	-1.82	-33.54	-8.82
Stanislaus County	4,468,934	7,009,046	4,462,100	6,018,627	-0.03	-16.06	-324.98	-87.16
Sutter County	2,627,534	1,250,886	2,627,534	1,200,940	0.00	-0.80	-16.28	-4.36

Tulare County	4,949,520	5,162,491	4,949,520	4,698,860	-0.01	-7.46	-146.06	-39.92
Tuolumne County	1,061,851	704,858	1,061,851	672,678	0.00	-0.58	-11.55	-3.04
Ventura County	23,052,919	3,582,886	22,950,834	3,401,970	-0.01	-4.82	-101.70	-22.34
Yolo County	3,574,531	4,283,723	3,571,768	4,089,822	-0.01	-3.17	-62.13	-16.90
Yuba County	1,539,292	667,915	1,539,292	646,109	0.00	-0.35	-7.23	-1.92
Rest CA (North of Bay Area/Sacramento)	23,861,125	10,256,688	23,859,192	10,027,004	-0.01	-3.83	-73.02	-20.02
Statewide Total	**1,054,222,473**	**200,381,820**	**1,049,615,590**	**173,715,386**	**(1)**	**-525**	**-10,572**	**-2,775**

Notes:

1. Assumed 365 days of statewide traffic to compute the annual emissions from the daily emissions.

C.1-9 Statewide Emissions: Vehicle Miles Traveled

This tab estimates operational emissions from statewide vehicle miles traveled; the values reflect the difference in vehicle miles traveled as a result of building the High Speed Train.

County	No Project		Full Build		Burden with Project (Tons/Year) [1]			
	Intraregional Traffic	Interregional Traffic	Intraregional Traffic	Interregional Traffic	CO_2	SO_2	PM_{10}	$PM_{2.5}$
Alameda County	38,222,605	5,972,890	38,220,010	5,331,919	-135,154	-1.29	-12.17	-7.51
Alpine County	1,347,851	56,094	1,347,851	53,366	-477	0.00	-0.05	-0.03
Amador County	4,107,029	553,991	4,107,029	539,799	-2,481	-0.02	-0.23	-0.14
Calaveras County	791,000	623,870	791,000	592,696	-5,557	-0.05	-0.51	-0.30
Contra Costa County	25,118,332	2,749,555	25,118,279	2,548,722	-42,199	-0.40	-3.80	-2.34
El Dorado County	8,990,386	414,970	8,990,386	389,345	-4,767	-0.04	-0.43	-0.27
Fresno County	14,091,970	13,275,979	14,091,970	10,272,315	-523,000	-4.83	-49.55	-29.00
Imperial County	11,572,109	615,583	11,560,757	609,415	-3,964	-0.04	-0.38	-0.24
Inyo County	4,599,805	579,151	4,599,805	559,096	-3,510	-0.03	-0.33	-0.20
Kern County	23,107,031	16,133,071	23,103,717	12,045,485	-719,275	-6.59	-67.51	-39.52
Kings County	1,352,741	1,783,979	1,352,741	1,310,372	-83,357	-0.76	-7.81	-4.76
Los Angeles County	249,400,317	16,160,002	247,129,828	12,568,662	-1,115,347	-10.88	-102.86	-63.68
Madera County	4,120,611	4,411,941	4,120,611	4,135,780	-48,333	-0.44	-4.56	-2.78
Marin County	7,506,605	455,025	7,506,600	360,137	-20,384	-0.19	-1.79	-1.15
Mariposa County	156,500	716,961	156,500	689,509	-4,825	-0.04	-0.45	-0.27
Merced County	4,172,211	9,362,159	4,163,142	7,855,311	-263,373	-2.45	-25.07	-14.68
Mono County	1,144,776	233,836	1,144,776	220,576	-2,478	-0.02	-0.23	-0.14
Monterey County	5,952,226	7,912,357	5,952,226	7,170,802	-128,531	-1.19	-12.23	-7.16
Napa County	3,605,674	1,233,028	3,605,674	1,186,972	-10,385	-0.09	-0.91	-0.59
Nevada County	5,797,940	1,850,290	5,797,940	1,777,745	-12,632	-0.12	-1.20	-0.70
Orange County	86,740,066	7,815,887	86,254,585	6,444,443	-346,320	-3.54	-31.74	-19.03
Placer County	9,998,119	2,359,851	9,998,119	2,214,214	-26,758	-0.23	-2.46	-1.46
Riverside County	95,925,053	5,361,861	95,310,335	4,491,144	-296,967	-2.99	-26.94	-16.53
Sacramento County	25,305,043	8,127,687	25,276,755	7,477,837	-120,414	-1.09	-11.14	-6.51
San Benito County	521,692	2,839,712	520,533	2,448,062	-68,157	-0.63	-6.49	-3.80
San Bernardino County	94,185,063	2,540,941	93,618,352	2,090,807	-202,952	-1.86	-18.55	-11.14
San Diego County	144,554,023	13,719,957	144,548,500	11,729,790	-388,119	-4.01	-35.33	-21.68
San Francisco County	10,204,563	352,678	10,109,396	304,409	-31,924	-0.31	-2.79	-1.79
San Joaquin County	8,602,454	14,115,259	8,568,383	12,629,866	-264,267	-2.45	-25.09	-15.28
San Luis Obispo County	3,377,987	5,033,257	3,377,937	4,562,852	-82,338	-0.76	-7.76	-4.73
San Mateo County	23,080,831	1,137,816	22,834,303	969,987	-73,461	-0.73	-6.84	-4.10
Santa Barbara County	3,675,376	4,418,706	3,675,376	3,917,182	-86,927	-0.81	-8.27	-4.84
Santa Clara County	43,327,579	7,536,024	43,209,663	6,746,484	-183,034	-1.78	-16.46	-10.30
Santa Cruz County	1,568,289	1,032,323	1,567,510	996,792	-6,575	-0.06	-0.61	-0.36
Solano County	11,620,349	4,480,693	11,620,349	4,308,566	-34,711	-0.35	-3.12	-1.94
Sonoma County	11,242,559	1,495,946	11,242,559	1,408,920	-18,694	-0.18	-1.65	-1.05
Stanislaus County	4,468,934	7,009,046	4,462,100	6,018,627	-175,396	-1.61	-16.45	-9.63
Sutter County	2,627,534	1,250,886	2,627,534	1,200,940	-8,778	-0.08	-0.82	-0.48

Tulare County	4,949,520	5,162,491	4,949,520	4,698,860	-80,535	-0.75	-7.65	-4.66
Tuolumne County	1,061,851	704,858	1,061,851	672,678	-6,260	-0.06	-0.57	-0.35
Ventura County	23,052,919	3,582,886	22,950,834	3,401,970	-55,565	-0.57	-4.80	-2.95
Yolo County	3,574,531	4,283,723	3,571,768	4,089,822	-34,083	-0.32	-3.24	-1.90
Yuba County	1,539,292	667,915	1,539,292	646,109	-3,887	-0.04	-0.36	-0.21
Rest CA (North of Bay Area/Sacramento)	23,861,125	10,256,688	23,859,192	10,027,004	-40,526	-0.37	-3.82	-2.33
Statewide Total	**1,054,222,473**	**200,381,820**	**1,049,615,590**	**173,715,386**	**-5,766,678**	**-55**	**-535**	**-323**

Notes:

1. Assumed 365 days of statewide traffic to compute the annual emissions from the daily emissions.

C.1-10 Regional and Statewide Emissions: Power and Flight Demands

This tab estimates operational emissions from regional and statewide power and flight demands; the values reflect the difference in power and flight demands as a result of building the High Speed Train.

Electricity and Flight Demands [1]

Electricity Required (GWh/day)	Total HSR (miles)	Change in Emissions due to HST (tons/day)						
		HC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2
8.32	830	0.10	1.04	0.70	0.09	0.15	0.13	2,757
Flight Origins	**No. of Flights Removed**	**Change in Emission Burdens due to HST (tons/day)**						
		HC	CO	NOx	SO_2 [2]	PM_{10}	$PM_{2.5}$	CO_2
Fresno/Madera	0	0.0	0.0	0.0	N/A	0.0	0.0	0
Merced	-1	0.0	-0.02	-0.02	N/A	0.0	0.0	-4
Total	-1	0.0	-0.02	-0.02	-0.001	0.0	0.0	-4

Notes:

1. Data taken from the Project Management Team's Air Quality Technical Report.
2. SO_2 emissions resulting from changes in flights were only provided as a total of all counties; to get the changes per 1 flight, divided the total value by 387 flights.

Regional Emissions

Alternative	Length (miles) [1]	Change in Emissions due to HST (tons/day)							Change in Emissions due to HST (tpy) [2]						
		HC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	HC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Electricity Emissions															
BNSF Ave 21	81.70	0.01	0.10	0.07	0.01	0.01	0.01	271.32	3.6	37.4	25.1	3.2	5.4	4.7	99,032
BNSF Ave 24	83.84	0.01	0.11	0.07	0.01	0.02	0.01	278.44	3.7	38.3	25.8	3.3	5.5	4.8	101,632
UPRR Ave 21	72.32	0.01	0.09	0.06	0.01	0.01	0.01	240.17	3.2	33.1	22.3	2.9	4.8	4.1	87,661
UPRR Ave 24	74.36	0.01	0.09	0.06	0.01	0.01	0.01	246.97	3.3	34.0	22.9	2.9	4.9	4.3	90,142
Hybrid Ave 24	64.08	0.01	0.08	0.05	0.01	0.01	0.01	212.82	2.8	29.3	19.7	2.5	4.2	3.7	77,679
Hybrid Ave 21	72.76	0.01	0.09	0.06	0.01	0.01	0.01	241.63	3.2	33.3	22.4	2.9	4.8	4.2	88,197
Flights Emissions															
All Alternatives	--	0.0	0.0	0.0	0.0	0.0	0.0	-4	0.0	-7.3	-7.3	-0.52	0.0	0.0	-1,372

Notes:

1. Data taken from AQ_lengths of alternatives_20110602.xlsx as provided by L. Black to K. Skadberg (6/2/11).
2. Days per year: 365

Statewide Emissions

Electricity Emissions

Electricity Required (GWh/day)	Total HSR (miles)	Change in Emissions due to HST (tons/day)							Change in Emission Burdens due to HST (Tons/Year) [1]						
		HC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	HC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2
8.32	830	0.10	1.04	0.70	0.09	0.15	0.13	2,757	37	380	256	33	55	47	1,006,123

Flights Emissions

Origin	No. of Flights Removed	Change in Emission Burdens due to HST (Tons/Day)							Change in Emission Burdens due to HST (Tons/Year) [1]						
		HC	CO	NOx	SO_2 [2]	PM_{10}	$PM_{2.5}$	CO_2	HC	CO	NOx	SO_2 [2]	PM_{10}	$PM_{2.5}$	CO_2
Central Coast	-1	0.00	-0.02	-0.02	0.00	0.00	0.00	-3.76	0.00	-7.30	-7.30	-0.52	0.00	0.00	-1,372
Far North	-16	-0.03	-0.24	-0.33	-0.02	0.00	0.00	-60.09	-10.95	-87.60	-120.45	-8.30	0.00	0.00	-21,933
Fresno/Madera	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Kern	-16	-0.03	-0.24	-0.33	-0.02	0.00	0.00	-60.09	-10.95	-87.60	-120.45	-8.30	0.00	0.00	-21,933
LA Basin_North	-43	-0.07	-0.66	-0.88	-0.06	-0.01	-0.01	-161.49	-25.55	-240.90	-321.20	-22.31	-3.65	-3.65	-58,944
LA Basin_South	-88	-0.15	-1.34	-1.80	-0.13	-0.01	-0.01	-330.48	-54.75	-489.10	-657.00	-45.65	-3.65	-3.65	-120,625
Merced	-1	0.00	-0.02	-0.02	0.00	0.00	0.00	-3.76	0.00	-7.30	-7.30	-0.52	0.00	0.00	-1,372
Monterey Bay	-16	-0.03	-0.24	-0.33	-0.02	0.00	0.00	-60.09	-10.95	-87.60	-120.45	-8.30	0.00	0.00	-21,933
Sacramento Region	-16	-0.03	-0.24	-0.33	-0.02	0.00	0.00	-60.09	-10.95	-87.60	-120.45	-8.30	0.00	0.00	-21,933
San Diego Region	-47	-0.08	-0.72	-0.96	-0.07	-0.01	-0.01	-176.51	-29.20	-262.80	-350.40	-24.38	-3.65	-3.65	-64,426
San Joaquin	-7	-0.01	-0.11	-0.14	-0.01	0.00	0.00	-26.29	-3.65	-40.15	-51.10	-3.63	0.00	0.00	-9,596
SF Bay Area	-130	-0.22	-1.98	-2.65	-0.18	-0.02	-0.02	-488.22	-80.30	-722.70	-967.25	-67.44	-7.30	-7.30	-178,200
South SJ Valley	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Stanislaus	-5	-0.01	-0.08	-0.10	-0.01	0.00	0.00	-18.78	-3.65	-29.20	-36.50	-2.59	0.00	0.00	-6,855
W. Sierra Nevada	-1	0.00	-0.02	-0.02	0.00	0.00	0.00	-3.76	0.00	-7.30	-7.30	-0.52	0.00	0.00	-1,372
Statewide Total	**-387**	**-0.65**	**-5.90**	**-7.90**	**-0.55**	**-0.06**	**-0.06**	**-1,453.38**	**-237**	**-2,154**	**-2,884**	**-201**	**-22**	**-22**	**-530,484**

Notes:

1. Assumed 365 days of statewide electricity usage and flights to compute the annual emissions from the daily emissions.
2. SO_2 emissions resulting from changes in flights were only provided as a total of all counties; to get the changes per 1 flight, divided the total value by 387 flights.

C.2 URBEMIS2007 Output File: Merced Station – Operation 2035

8/3/2010 4:27:33 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Merced Station - Operation 2035.urb924

Project Name: Merced Station - Operation 2035

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.02	0.15	0.26	0.00	0.00	0.00	176.63
TOTALS (tons/year, mitigated)	0.02	0.12	0.21	0.00	0.00	0.00	141.35
Percent Reduction	0.00	20.00	19.23	NaN	NaN	NaN	19.97

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.02	0.15	0.26	0.00	0.00	0.00	176.63

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.15	0.12	0.00	0.00	0.00	176.38
Hearth							
Landscape	0.01	0.00	0.14	0.00	0.00	0.00	0.25
Consumer Products							
Architectural Coatings							
TOTALS (tons/year, unmitigated)	0.02	0.15	0.26	0.00	0.00	0.00	176.63

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.12	0.10	0.00	0.00	0.00	141.10
Hearth							
Landscape	0.01	0.00	0.11	0.00	0.00	0.00	0.25
Consumer Products							
Architectural Coatings							
TOTALS (tons/year, mitigated)	0.02	0.12	0.21	0.00	0.00	0.00	141.35

Area Source Changes to Defaults

C.3 EMFAC Output

C.3-1 Emission Factors for Non-Bus Offsite Vehicles for 2035 Operational Emissions

Title : SJVAB Annual
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/08/04 13:29:42
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2035 -- Model Years 1991 to 2035 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006
District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0	0.036	0.155	0.036	0	0.041	0.164	0.042	0	0.081	0.183	0.081	0	0.107	0.153	0.107	0	0.048	0.219	0.081	0	0.036	0.195	0.103	0	0.075	0.311	0.269	0	3.327	2.377	2.389	0	0.246	0.304	0.294	0	4.51	1.431	2.548	5.633	4.281	0	4.725	0	1.094	0.679	0.727	0	0.061	0.14	0.068	5.633	0.096	1.959	0.375
35	0	0.006	0.05	0.006	0	0.006	0.053	0.006	0	0.012	0.06	0.012	0	0.015	0.05	0.015	0	0.007	0.071	0.019	0	0.005	0.063	0.03	0	0.011	0.101	0.085	0	0.428	0.242	0.244	0	0.034	0.099	0.087	0	0.654	0.353	0.462	2.652	1.423	0	1.826	0	0.153	0.221	0.213	0	0.009	0.046	0.012	2.652	0.02	0.214	0.055
45	0	0.005	0.041	0.005	0	0.005	0.044	0.005	0	0.01	0.049	0.01	0	0.013	0.041	0.013	0	0.005	0.058	0.015	0	0.004	0.052	0.024	0	0.008	0.083	0.07	0	0.302	0.188	0.19	0	0.025	0.081	0.071	0	0.479	0.292	0.36	2.996	1.533	0	2.014	0	0.11	0.181	0.173	0	0.006	0.038	0.009	2.996	0.019	0.168	0.049
65	0	0.006	0.036	0.006	0	0.007	0.038	0.007	0	0.013	0.043	0.013	0	0.017	0.036	0.017	0	0.004	0.051	0.013	0	0.003	0.046	0.021	0	0.007	0.073	0.061	0	0.265	0.151	0.152	0	0.022	0.071	0.062	0	0.426	0.306	0.35	6.658	3.435	0	4.493	0	0.097	0.159	0.152	0	0.006	0.033	0.008	6.658	0.035	0.136	0.07

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0	0.782	1.942	0.782	0	0.875	1.988	0.877	0	1.483	2.09	1.483	0	2.003	1.932	2.003	0	0.737	2.616	1.1	0	0.569	2.382	1.338	0	1.098	5.283	4.535	0	136.107	4.702	6.317	0	3.283	5.195	4.843	0	53.392	6.739	23.66	40.566	13.793	0	22.584	0	14.4	8.935	9.569	0	0.812	2.184	0.939	40.566	1.454	4.704	2.031
35	0	0.467	0.413	0.467	0	0.521	0.423	0.521	0	0.883	0.445	0.883	0	1.192	0.411	1.192	0	0.146	0.556	0.225	0	0.113	0.507	0.28	0	0.217	1.124	0.962	0	26.935	1.015	1.333	0	0.65	1.105	1.021	0	10.566	1.03	4.489	26.83	8.664	0	14.629	0	2.85	1.9	2.01	0	0.161	0.465	0.189	26.83	0.756	1.009	0.872
45	0	0.402	0.355	0.402	0	0.449	0.363	0.449	0	0.761	0.382	0.761	0	1.027	0.353	1.027	0	0.132	0.478	0.199	0	0.102	0.435	0.243	0	0.197	0.965	0.828	0	24.372	1.039	1.325	0	0.588	0.949	0.883	0	9.561	0.89	4.035	35.365	8.236	0	17.144	0	2.579	1.632	1.742	0	0.145	0.399	0.169	35.365	0.66	1	0.814
65	0	0.309	0.452	0.309	0	0.345	0.463	0.346	0	0.585	0.486	0.585	0	0.791	0.45	0.791	0	0.209	0.609	0.286	0	0.161	0.554	0.328	0	0.311	1.229	1.065	0	38.607	1.322	1.78	0	0.931	1.209	1.158	0	15.145	1.366	6.364	114.334	11.391	0	45.193	0	4.085	2.079	2.312	0	0.23	0.508	0.256	114.334	0.586	1.274	1.033

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0	0.055	2.11	0.055	0	0.062	2.1	0.065	0	0.117	2.077	0.117	0	0.142	2.112	0.142	0	0.088	1.568	0.374	0	0.07	1.336	0.607	0	0.115	1.627	1.357	0	3.535	6.723	6.683	0	0.259	1.563	1.323	0	3.772	20.975	14.736	0.991	1.226	0	1.149	0	0.977	6.367	5.742	0	0.112	2.572	0.34	0.991	0.098	5.857	0.91
35	0	0.031	1.172	0.031	0	0.035	1.166	0.037	0	0.066	1.154	0.066	0	0.08	1.173	0.08	0	0.115	0.871	0.261	0	0.091	0.742	0.368	0	0.15	0.904	0.769	0	4.61	2.335	2.363	0	0.338	0.868	0.77	0	4.919	8.894	7.452	1.288	0.925	0	1.045	0	1.274	3.537	3.274	0	0.146	1.429	0.265	1.288	0.066	2.122	0.359
45	0	0.03	1.28	0.03	0	0.033	1.274	0.035	0	0.063	1.26	0.063	0	0.076	1.281	0.076	0	0.124	0.951	0.284	0	0.098	0.81	0.401	0	0.162	0.987	0.839	0	4.969	2.058	2.093	0	0.364	0.948	0.84	0	5.302	9.968	8.275	1.391	0.947	0	1.093	0	1.373	3.862	3.573	0	0.157	1.56	0.287	1.391	0.065	1.927	0.331
65	0	0.032	2.337	0.032	0	0.036	2.325	0.04	0	0.069	2.3	0.069	0	0.084	2.339	0.085	0	0.142	1.736	0.45	0	0.113	1.48	0.693	0	0.185	1.802	1.513	0	5.685	2.106	2.15	0	0.417	1.731	1.489	0	6.067	22.813	16.739	1.595	1.173	0	1.312	0	1.571	7.051	6.415	0	0.18	2.848	0.427	1.595	0.073	2.238	0.382

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0	921.799	345.72	921.789	0	1163.998	345.72	1162.545	0	1190.619	345.72	1190.598	0	1619.535	345.72	1619.325	0	2513.51	519.007	2128.576	0	2513.51	519.222	1667.16	0	2513.51	1505	1685.346	0	2513.51	3845.361	3828.993	0	2513.51	1505	1690.781	0	2513.51	2367.183	2420.256	232.686	282.878	0	266.397	0	2513.51	1505	1621.975	0	2513.51	1505	2419.881	232.686	1156.17	3314.219	1456.373
35	0	299.856	345.72	299.857	0	378.641	345.72	378.583	0	387.301	345.72	387.3	0	526.825	345.72	526.795	0	497.421	519.007	501.587	0	497.421	519.222	506.673	0	497.421	1505	1324.82	0	497.421	1827.808	1811.458	0	497.421	1505	1319.39	0	497.421	2367.183	1689.019	115.041	92.196	0	139.996	0	497.421	1505	1388.133	0	497.421	1505	590.963	115.041	364.54	1709.74	552.674
45	0	277.705	345.72	277.706	0	350.671	345.72	350.662	0	358.691	345.72	358.691	0	487.908	345.72	487.884	0	450.085	519.007	463.387	0	450.085	519.222	479.426	0	450.085	1505	1316.355	0	450.085	1701.031	1685.656	0	450.085	1505	1310.671	0	450.085	2367.182	1671.85	102.934	165.141	0	144.715	0	450.085	1505	1382.643	0	450.085	1505	548.022	102.934	337.392	1608.919	515.227
65	0	372.217	345.72	372.216	0	470.015	345.72	469.794	0	480.764	345.72	480.761	0	653.958	345.72	653.907	0	712.968	519.007	675.534	0	712.968	519.222	630.745	0	712.968	1505	1363.365	0	712.968	1711.772	1699.496	0	712.968	1505	1359.097	0	712.968	2367.182	1767.197	99.195	303.161	0	236.188	0	712.968	1505	1413.134	0	712.968	1505	786.499	99.195	456.93	1617.461	618.798

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0	0.009	0.003	0.009	0	0.011	0.003	0.011	0	0.011	0.003	0.011	0	0.016	0.003	0.016	0	0.024	0.005	0.02	0	0.024	0.005	0.016	0	0.024	0.014	0.016	0	0.026	0.037	0.037	0	0.024	0.014	0.016	0	0.025	0.023	0.023	0.003	0.003	0	0.003	0	0.024	0.014	0.016	0	0.024	0.014	0.023	0.003	0.011	0.032	0.014
35	0	0.003	0.003	0.003	0	0.004	0.003	0.004	0	0.004	0.003	0.004	0	0.005	0.003	0.005	0	0.005	0.005	0.005	0	0.005	0.005	0.005	0	0.005	0.014	0.013	0	0.005	0.017	0.017	0	0.005	0.014	0.013	0	0.005	0.023	0.016	0.002	0.002	0	0.002	0	0.005	0.014	0.013	0	0.005	0.014	0.006	0.002	0.004	0.016	0.005
45	0	0.003	0.003	0.003	0	0.003	0.003	0.003	0	0.003	0.003	0.003	0	0.005	0.003	0.005	0	0.004	0.005	0.004	0	0.004	0.005	0.005	0	0.004	0.014	0.013	0	0.005	0.016	0.016	0	0.004	0.014	0.013	0	0.004	0.023	0.016	0.002	0.002	0	0.002	0	0.004	0.014	0.013	0	0.004	0.014	0.005	0.002	0.003	0.015	0.005
65	0	0.004	0.003	0.004	0	0.005	0.003	0.005	0	0.005	0.003	0.005	0	0.006	0.003	0.006	0	0.007	0.005	0.006	0	0.007	0.005	0.006	0	0.007	0.014	0.013	0	0.007	0.016	0.016	0	0.007	0.014	0.013	0	0.007	0.023	0.017	0.003	0.003	0	0.003	0	0.007	0.014	0.014	0	0.007	0.014	0.008	0.003	0.004	0.015	0.006

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0	0.057	0.096	0.057	0	0.064	0.101	0.065	0	0.143	0.114	0.143	0	0.149	0.094	0.149	0	0.047	0.059	0.049	0	0.044	0.052	0.047	0	0.059	0.364	0.309	0	0.092	0.094	0.094	0	0.06	0.356	0.302	0	0.093	0.647	0.446	0.08	0.006	0	0.03	0	0.065	0.712	0.637	0	0.015	0.173	0.03	0.08	0.088	0.137	0.095
35	0	0.009	0.031	0.009	0	0.01	0.033	0.011	0	0.023	0.037	0.023	0	0.024	0.031	0.024	0	0.007	0.019	0.009	0	0.006	0.017	0.011	0	0.009	0.118	0.099	0	0.014	0.072	0.071	0	0.009	0.116	0.096	0	0.014	0.159	0.107	0.038	0.002	0	0.014	0	0.01	0.232	0.206	0	0.002	0.056	0.007	0.038	0.014	0.077	0.023
45	0	0.008	0.026	0.008	0	0.009	0.027	0.009	0	0.019	0.031	0.019	0	0.02	0.025	0.02	0	0.005	0.016	0.007	0	0.005	0.014	0.009	0	0.006	0.097	0.081	0	0.01	0.087	0.086	0	0.006	0.095	0.079	0	0.01	0.132	0.088	0.043	0.002	0	0.016	0	0.007	0.19	0.169	0	0.002	0.046	0.006	0.043	0.012	0.085	0.022
65	0	0.01	0.022	0.01	0	0.012	0.024	0.012	0	0.026	0.027	0.026	0	0.027	0.022	0.027	0	0.005	0.014	0.006	0	0.004	0.012	0.008	0	0.006	0.085	0.071	0	0.009	0.151	0.149	0	0.006	0.083	0.069	0	0.009	0.138	0.091	0.095	0.005	0	0.034	0	0.006	0.167	0.148	0	0.002	0.04	0.005	0.095	0.016	0.135	0.033

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.012	0.012	0	0.012	0.008	0.009	0.004	0.004	0	0.004	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0.004	0.008	0.031	0.011
35	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.012	0.012	0	0.012	0.008	0.009	0.004	0.004	0	0.004	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0.004	0.008	0.031	0.011
45	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.012	0.012	0	0.012	0.008	0.009	0.004	0.004	0	0.004	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0.004	0.008	0.031	0.011
65	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.008	0.008	0.008	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.012	0.012	0	0.012	0.008	0.009	0.004	0.004	0	0.004	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0.004	0.008	0.031	0.011

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.013	0.025	0.014
35	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.013	0.025	0.014
45	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.013	0.025	0.014
65	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.013	0.025	0.014

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

| Speed | LDA | LDA | LDA | LDA | LDT1 | LDT1 | LDT1 | LDT1 | LDT2 | LDT2 | LDT2 | LDT2 | MDV | MDV | MDV | MDV | LHD1 | LHD1 | LHD1 | LHD1 | LHD2 | LHD2 | LHD2 | LHD2 | MHD | MHD | MHD | MHD | HHD | HHD | HHD | HHD | OBUS | OBUS | OBUS | OBUS | UBUS | UBUS | UBUS | UBUS | MCY | MCY | MCY | MC

C.3-2 Emission Factors for Buses for 2035 Operational Emissions

Title : Bus
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/07/22 18:56:13
Scen Year: 2035 -- All model years in the range 2023 to 2035 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2035 -- Model Years 2023 to 2035 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.063	0.087	0.072
35	0	0.009	0.022	0.014
45	0	0.007	0.018	0.011
65	0	0.006	0.019	0.011

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	1.228	3.981	2.272
35	0	0.243	0.609	0.382
45	0	0.22	0.526	0.336
65	0	0.348	0.807	0.522

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.274	1.096	0.586
35	0	0.358	0.465	0.398
45	0	0.386	0.521	0.437
65	0	0.441	1.193	0.726

C.3-2 Emission Factors for Buses for 2035 Operational Emissions

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	2513.51	2151.028	2376.111
35	0	497.421	2151.028	1124.221
45	0	450.085	2151.028	1094.827
65	0	712.968	2151.028	1258.065

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.024	0.021	0.023
35	0	0.005	0.021	0.011
45	0	0.004	0.021	0.01
65	0	0.007	0.021	0.012

C.3-2 Emission Factors for Buses for 2035 Operational Emissions

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.08	0.106	0.09
35	0	0.012	0.026	0.017
45	0	0.009	0.022	0.014
65	0	0.008	0.023	0.013

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.012	0.008	0.01
35	0	0.012	0.008	0.01
45	0	0.012	0.008	0.01
65	0	0.012	0.008	0.01

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.013	0.013	0.013
35	0	0.013	0.013	0.013
45	0	0.013	0.013	0.013
65	0	0.013	0.013	0.013

Pollutant Name: PM2.5 Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.074	0.097	0.083
35	0	0.011	0.024	0.016
45	0	0.008	0.02	0.013
65	0	0.007	0.021	0.012

Pollutant Name: PM2.5 - Tire Wear Temperature: 67F Relative Humidity: 55%

C.3-2 Emission Factors for Buses for 2035 Operational Emissions

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.003	0.002	0.003
35	0	0.003	0.002	0.003
45	0	0.003	0.002	0.003
65	0	0.003	0.002	0.003

Pollutant Name: PM2.5 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.005	0.005	0.005
35	0	0.005	0.005	0.005
45	0	0.005	0.005	0.005
65	0	0.005	0.005	0.005

Pollutant Name: Methane Temperature: 67F Relative Humidity: 55%

Speed MPH	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL
5	0	0.05	0.004	0.033
35	0	0.008	0.001	0.005
45	0	0.006	0.001	0.004
65	0	0.005	0.001	0.003

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APPENDIX D

Microscale CO Analysis

Contents

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D.1-2 Merced HST Station
D.1-3 Herndon Ave and Shaw Ave Area
D.1-4 SR-99 Realignment Area

D.2 EMFAC Runs
D.2-1 2009 EMFAC Runs
D.2-2 2035 EMFAC RunsA.1 Construction Schedule

D.1-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	Existing					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	Winton Wy / Bellevue Rd	Signalized	C	27.7	1615	C	28.5	1716
2	Atwater Blvd / Applegate Rd	Signalized	C	29.6	1501	C	31.5	2032
3	Sycamore Ave / SR-99 NB Ramps	Unsignalized	A	7.9	377	A	8.1	418
4	Sycamore Ave / Applegate Rd	Signalized	C	20.0	898	C	23.1	1322
5	Bell Ln / Mall Access / SR-99 SB Ramps	Signalized	C	24.4	482	C	24.4	524
6	Bell Dr / Bell Ln	Signalized	C	20.0	656	B	19.4	704
7	Bell Dr / Commerce Ave / Applegate Rd	Signalized	C	26.8	1009	C	31.0	1442
8	Mall Access / Applegate Rd	Unsignalized	A	0.2	733	A	0.1	1115
9	Santa Fe Dr / Buhach Rd / Airdrome Entry	Signalized	C	21.4	1045	C	23.5	1094
10	Buhach Rd / Bellevue Rd	Signalized	C	25.2	928	C	27.2	1144
11	Ashby Rd / Buhach Rd	Unsignalized	D	14.5	1214	E	23.0	1364
12	Ashby Rd / N 193	Unsignalized	D	7.4	1043	C	4.0	951
13	Ashby Rd / SR-99 SB Ramps	Unsignalized	B	2.6	816	B	3.3	820
14	Santa Fe Dr / Bellevue Rd	Signalized	B	15.2	1034	B	10.9	1275
15	Santa Fe Dr / F St	Signalized	A	7.4	1191	A	8.8	1390
16	Santa Fe Dr / W Ave 2	Unsignalized	C	4.0	1612	B	2.8	1677
17	Santa Fe Dr / N Franklin Rd	Signalized	B	17.0	1832	B	16.0	2048
18	Ashby Rd / Franklin Rd	Unsignalized	B	11.7	924	B	12.5	974
19	Santa Fe Dr / Belcher Ave	Unsignalized	B	2.8	1478	B	3.2	1791
20	Olive Ave - Santa Fe Dr / SR-59	Signalized	D	35.4	2219	D	39.4	3161
21	Santa Fe Dr/ AM Express WB Ramps	Signalized	-	-	-	-	-	-
22	Santa Fe Dr/ AM Express EB Ramps	Signalized	-	-	-	-	-	-
23	SR-99 NB Ramps/AM Express	Signalized	-	-	-	-	-	-
24	SR-99 SB Ramps/AM Express	Signalized	-	-	-	-	-	-
25	16th St / SR-59	Unsignalized	C	9.1	1360	F	22.9	1961
26	*13th St - SR-99 SB Off-Ramp / V St*	*Signalized*	*C*	*32.2*	*2080*	*C*	*33.1*	*2311*
27	14th St - SR-99 NB Onramp / V St	Signalized	B	18.6	1545	B	18.0	1990
28	15th St / V St	Signalized	B	16.7	1299	C	25.0	1867
29	16th St / V St	Signalized	C	21.5	2067	C	27.0	2640
30	13th St / R St	Signalized	B	14.3	1466	B	15.0	1811
31	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	B	20.0	1449	B	19.0	1809
32	15th St / R St	Signalized	B	17.1	1141	C	25.2	1892
33	16th St / R St	Signalized	C	31.8	1838	C	33.7	2861
34	Olive Ave / R St	*Signalized*	D	50.9	2490	*E*	*56.2*	*3810*
35	15th St / O St	Unsignalized	A	7.6	291	A	8.5	511
36	16th St / O St	Signalized	C	21.1	1015	B	19.8	1585

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	Existing					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
37	15th St / M St	Unsignalized	B	11.0	822	B	12.7	992
38	*16th St / M St*	*Signalized*	*C*	*32.9*	*1570*	*C*	*33.7*	*2297*
39	Olive Ave / M St	*Signalized*	D	54.5	3042	*E*	*58.6*	*3971*
40	2nd St / Grogan Ave / Northwest Ave	Unsignalized	A	9.8	581	B	10.0	640
41	Childs Ave / Martin Luther King Wy	Signalized	D	39.2	1231	D	41.2	1516
42	13th St / Martin Luther King Wy	Signalized	C	25.7	1149	C	27.4	1495
43	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	C	5.6	1138	C	3.8	1264
44	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	C	3.8	1104	C	3.1	1325
45	14th St / Martin Luther King Wy	Unsignalized	C	1.4	871	C	2.2	1254
46	15th St / Martin Luther King Wy	Signalized	B	12.4	856	B	14.8	1306
47	16th St / Martin Luther King Wy	Signalized	C	29.1	1337	C	31.2	2015
48	13th St / G St	Signalized	B	12.9	1021	C	15.4	1219
49	SR-99 - 14th St / G St	Unsignalized	B	1.3	869	B	1.1	990
50	16th St / G Street	Signalized	C	31.4	1917	C	32.8	2374
51	Olive Ave / G St	Signalized	D	46.8	3187	D	48.0	3666
52	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	B	6.0	810	D	7.1	1003
53	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	E	19.1	1069	F	30.8	1170
54	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	D	3.1	1536	F	11.3	1689
55	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Unsignalized	D	42.6	1630	D	36.9	1685
56	14th St / O St	Unsignalized	A	2.6	164	B	3.8	296
57	13th St / M St	Unsignalized	B	12.7	955	C	15.8	1106
58	14th St / M St	Unsignalized	B	0.9	664	C	1.7	762
59	Main St / M St	Signalized	A	9.7	1566	B	13.2	1858
60	18th St / M St	Signalized	B	12.2	1439	B	13.5	1555
61	15th St / Canal St	Unsignalized	B	5.1	256	B	7.5	493
62	16th St / Canal St	Unsignalized	C	1.6	1106	C	2.0	1447
63	11th St / Martin Luther King Wy	Unsignalized	C	1.9	957	C	3.1	1119
64	Main St / Martin Luther King Wy	Signalized	A	9.5	513	A	9.9	814
65	18th St / Martin Luther King Wy	Unsignalized	A	7.7	252	A	8.0	347
66	16th St / H St	Unsignalized	B	0.6	731	B	1.0	980
67	Main St / H St	Unsignalized	A	1.5	252	B	2.1	398
68	15th St / G St	Unsignalized	B	1.6	708	C	3.3	910
69	*Main St / G St*	*Signalized*	*B*	*16.8*	*877*	*C*	*20.1*	*919*
70	18th St / G St	Signalized	A	8.5	749	A	4.5	601
71	15th St / D St	Unsignalized	B	8.1	363	B	8.4	364
72	16th St / D St	Unsignalized	A	4.0	670	B	3.4	943

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	2035 No Build					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	Winton Wy / Bellevue Rd	Signalized	C	30.1	3228	D	43.2	3542
2	Atwater Blvd / Applegate Rd	Signalized	D	44.7	2986	F	108.8	4086
3	Sycamore Ave / SR-99 NB Ramps	Unsignalized	A	8.6	714	B	9.5	817
4	Sycamore Ave / Applegate Rd	Signalized	D	36.9	1918	F	132.9	2795
5	Bell Ln / Mall Access / SR-99 SB Ramps	Signalized	C	24.6	1040	C	25.0	1141
6	Bell Dr / Bell Ln	Signalized	C	20.9	1238	C	20.8	1357
7	Bell Dr / Commerce Ave / Applegate Rd	Signalized	C	28.4	2075	C	32.4	2957
8	Mall Access / Applegate Rd	Unsignalized	B	0.1	1612	B	0.1	2456
9	Santa Fe Dr / Buhach Rd / Airdrome Entry	Signalized	C	22.7	1943	C	26.0	2075
10	Buhach Rd / Bellevue Rd	Signalized	C	28.1	1787	C	30.9	2186
11	Ashby Rd / Buhach Rd	Unsignalized	-	-	-	-	-	-
12	Ashby Rd / N 193	Unsignalized	-	-	-	-	-	-
13	Ashby Rd / SR-99 SB Ramps	Unsignalized	-	-	-	-	-	-
14	Santa Fe Dr / Bellevue Rd	Signalized	B	19.1	1901	B	12.7	2303
15	Santa Fe Dr / F St	Signalized	A	8.8	2095	B	12.9	2515
16	Santa Fe Dr / W Ave 2	Unsignalized	F	69.0	2940	F	53.2	2990
17	Santa Fe Dr / N Franklin Rd	Signalized	E	56.0	3365	D	46.9	3706
18	Ashby Rd / Franklin Rd	Unsignalized	-	-	-	-	-	-
19	Santa Fe Dr / Belcher Ave	Unsignalized	C	5.0	2656	F	58.6	3233
20	Olive Ave - Santa Fe Dr / SR-59	Signalized	E	56.2	3997	F	131.5	5786
21	Santa Fe Dr/ AM Express WB Ramps	Signalized	C	21.8	4033	C	23.9	4431
22	Santa Fe Dr/ AM Express EB Ramps	Signalized	B	19.7	3191	C	21.2	3768
23	SR-99 NB Ramps/AM Express	Signalized	C	21.0	3752	B	16.5	3485
24	SR-99 SB Ramps/AM Express	Signalized	C	20.0	3347	B	18.5	3430
25	16th St / SR-59	Unsignalized	F	128.0	2535	F	747.0	3720
26	*13th St - SR-99 SB Off-Ramp / V St*	*Signalized*	*F*	*89.0*	*3690*	*F*	*113.4*	*4153*
27	14th St - SR-99 NB Onramp / V St	Signalized	C	23.3	2977	C	30.7	3842
28	15th St / V St	Signalized	B	17.2	2493	C	28.7	3522
29	16th St / V St	Signalized	E	57.6	3675	F	132.3	4786
30	13th St / R St	Signalized	B	17.4	2631	C	33.0	3302
31	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	23.1	2797	C	24.3	3495
32	15th St / R St	Signalized	B	16.4	2184	C	26.5	3565
33	16th St / R St	Signalized	C	33.9	3372	D	46.7	5305
34	Olive Ave / R St	Signalized	E	59.5	4499	F	114.5	6943
35	15th St / O St	Unsignalized	A	8.6	543	B	11.5	937
36	16th St / O St	Signalized	C	21.0	1795	C	22.1	2819

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	2035 No Build					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
37	15th St / M St	Unsignalized	F	67.4	1574	F	145.6	1864
38	*16th St / M St*	*Signalized*	*D*	*36.0*	*2894*	*D*	*43.8*	*4208*
39	Olive Ave / M St	Signalized	F	81.4	5586	F	163.2	7291
40	2nd St / Grogan Ave / Northwest Ave	Unsignalized	C	16.6	1081	C	16.9	1159
41	Childs Ave / Martin Luther King Wy	Signalized	E	56.7	2302	F	93.1	2833
42	13th St / Martin Luther King Wy	Signalized	C	26.8	2122	C	32.7	2745
43	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	F	79.2	2061	F	73.2	2348
44	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	F	93.1	2115	F	115.7	2559
45	14th St / Martin Luther King Wy	Unsignalized	F	3.2	1651	F	43.1	2362
46	15th St / Martin Luther King Wy	Signalized	B	13.9	1632	B	17.6	2470
47	16th St / Martin Luther King Wy	Signalized	C	33.3	2418	F	80.5	3605
48	13th St / G St	Signalized	F	125.8	1915	F	190.6	2293
49	SR-99 - 14th St / G St	Unsignalized	E	2.6	1670	E	2.5	1902
50	16th St / G Street	Signalized	D	39.7	3581	D	51.6	4360
51	Olive Ave / G St	Signalized	F	86.0	5935	F	96.4	6671
52	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	C	7.1	1501	F	33.1	1728
53	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	341.6	1922	F	465.6	2107
54	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	111.8	2960	F	OVFL	3217
55	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Unsignalized	F	232.2	2935	F	200.6	3073
56	14th St / O St	Unsignalized	B	2.7	303	B	4.6	543
57	13th St / M St	Unsignalized	F	70.2	1691	F	136.2	1955
58	14th St / M St	Unsignalized	D	1.5	1224	E	3.7	1401
59	Main St / M St	Signalized	B	11.8	2881	B	18.7	3394
60	18th St / M St	Signalized	B	13.0	2667	B	14.4	2881
61	15th St / Canal St	Unsignalized	B	5.6	456	C	11.8	872
62	16th St / Canal St	Unsignalized	E	3.8	1898	F	18.5	2452
63	11th St / Martin Luther King Wy	Unsignalized	F	8.7	1770	F	OVFL	2068
64	Main St / Martin Luther King Wy	Signalized	A	9.9	924	B	10.9	1433
65	18th St / Martin Luther King Wy	Unsignalized	A	8.6	464	A	9.6	633
66	16th St / H St	Unsignalized	C	0.9	1250	D	1.7	1647
67	Main St / H St	Unsignalized	B	1.8	443	B	2.8	686
68	15th St / G St	Unsignalized	D	2.5	1299	F	17.5	1649
69	*Main St / G St*	*Signalized*	*B*	*18.3*	*1604*	*C*	*21.2*	*1646*
70	18th St / G St	Signalized	A	9.2	1382	A	4.5	1105
71	15th St / D St	Unsignalized	D	9.8	682	C	10.0	667
72	16th St / D St	Unsignalized	B	5.1	1170	C	5.3	1589

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	2035 Build A					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	Winton Wy / Bellevue Rd	Signalized	C	30.2	3264	D	45.3	3578
2	Atwater Blvd / Applegate Rd	Signalized	D	46.4	3022	F	113.9	4122
3	Sycamore Ave / SR-99 NB Ramps	Unsignalized	A	9.9	727	B	11.3	840
4	Sycamore Ave / Applegate Rd	Signalized	D	38.4	1954	F	140.2	2831
5	Bell Ln / Mall Access / SR-99 SB Ramps	Signalized	C	24.8	1063	C	25.0	1154
6	Bell Dr / Bell Ln	Signalized	C	21.1	1261	C	20.9	1370
7	Bell Dr / Commerce Ave / Applegate Rd	Signalized	C	29.1	2098	C	32.8	2970
8	Mall Access / Applegate Rd	Unsignalized	B	10.1	1635	B	11.0	2469
9	Santa Fe Dr / Buhach Rd / Airdrome Entry	Signalized	C	28.2	2672	C	30.2	2804
10	Buhach Rd / Bellevue Rd	Signalized	C	28.4	1845	C	31.3	2244
11	Ashby Rd / Buhach Rd	Unsignalized	-	-	-	-	-	-
12	Ashby Rd / N 193	Unsignalized	-	-	-	-	-	-
13	Ashby Rd / SR-99 SB Ramps	Unsignalized	-	-	-	-	-	-
14	Santa Fe Dr / Bellevue Rd	Signalized	B	18.2	2536	B	15.5	2938
15	Santa Fe Dr / F St	Signalized	A	8.5	2730	B	12.0	3150
16	Santa Fe Dr / W Ave 2	Unsignalized	F	505.0	3575	F	1969.0	3625
17	Santa Fe Dr / N Franklin Rd	Signalized	E	57.3	3438	D	48.8	3779
18	Ashby Rd / Franklin Rd	All-Way Stop	-	-	-	-	-	-
19	Santa Fe Dr / Belcher Ave	Unsignalized	C	22.4	2729	F	380.2	3306
20	Olive Ave - Santa Fe Dr / SR-59	Signalized	E	57.6	4095	F	136.8	5884
21	Santa Fe Dr/ AM Express WB Ramps	Signalized	D	44.0	4666	D	38.5	5066
22	Santa Fe Dr/ AM Express EB Ramps	Signalized	D	41.6	3613	C	29.1	4053
23	SR-99 NB Ramps/AM Express	Signalized	D	37.4	4277	C	20.3	4011
24	SR-99 SB Ramps/AM Express	Signalized	C	20.9	3566	B	18.9	3750
25	16th St / SR-59	Unsignalized	F	377.3	2589	F	3159.0	3779
26	*13th St - SR-99 SB Off-Ramp / V St*	*Signalized*	*F*	*120.7*	*4049*	*F*	*136.9*	*4368*
27	14th St - SR-99 NB Onramp / V St	Signalized	C	23.6	3185	D	42.3	4220
28	15th St / V St	Signalized	B	17.1	2551	C	28.7	3580
29	16th St / V St	Signalized	E	59.4	3787	F	137.2	4903
30	13th St / R St	Signalized	B	18.9	2942	D	35.3	3464
31	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	24.1	3016	C	30.6	3800
32	15th St / R St	Signalized	B	16.2	2289	C	26.6	3633
33	16th St / R St	Signalized	C	34.6	3551	D	49.3	5487
34	Olive Ave / R St	Signalized	E	59.6	4515	F	115.2	6959
35	15th St / O St	All-Way Stop	A	9.0	612	B	12.5	1013
36	16th St / O St	Signalized	C	20.1	1966	C	21.8	2991

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	2035 Build A					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
37	15th St / M St	All-Way Stop	F	345.5	2479	F	505.1	2934
38	*16th St / M St*	*Signalized*	*D*	*44.1*	*3594*	*E*	*74.5*	*5063*
39	Olive Ave / M St	Signalized	F	81.6	5602	F	164.2	7307
40	2nd St / Grogan Ave / Northwest Ave	All-Way Stop	C	16.6	1081	C	16.9	1159
41	Childs Ave / Martin Luther King Wy	Signalized	E	58.0	2360	F	97.9	2891
42	13th St / Martin Luther King Wy	Signalized	C	32.3	2280	D	46.4	2891
43	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	F	364.0	2114	F	352.2	2236
44	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	F	801.7	2080	F	2119.7	2444
45	14th St / Martin Luther King Wy	Unsignalized	F	585.1	1673	F	OVFL	2386
46	15th St / Martin Luther King Wy	-	-	-	-	-	-	-
47	16th St / Martin Luther King Wy	-	-	-	-	-	-	-
48	13th St / G St	All-Way Stop	F	392.3	2582	F	419.7	2960
49	SR-99 - 14th St / G St	Unsignalized	F	121.5	2059	F	501.0	2337
50	16th St / G Street	-	-	-	-	-	-	-
51	Olive Ave / G St	Signalized	F	86.3	5952	F	96.7	6688
52	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	C	18.2	821	B	15.0	661
53	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	242.5	1349	F	179.1	1228
54	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	5271.0	3215	F	14621.0	3245
55	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Signalized	F	268.2	3201	F	208.0	3106
56	14th St / O St	Unsignalized	B	12.7	439	E	35.1	846
57	13th St / M St	All-Way Stop	F	150.2	2016	F	209.6	2235
58	14th St / M St	Unsignalized	F	61.8	1773	F	383.4	1997
59	Main St / M St	Signalized	B	12.0	2978	C	21.0	3562
60	18th St / M St	Signalized	B	13.1	2703	B	14.6	2917
61	15th St / Canal St	All-Way Stop	B	14.3	989	E	42.2	1458
62	16th St / Canal St	Unsignalized	F	234.2	2299	F	1759.0	2844
63	11th St / Martin Luther King Wy	Unsignalized	F	143.0	1826	F	OVFL	2124
64	Main St / Martin Luther King Wy	Signalized	B	12.2	1767	C	31.4	2717
65	18th St / Martin Luther King Wy	All-Way Stop	A	9.0	584	A	9.7	653
66	16th St / H St	Signalized	D	35.9	1709	D	53.0	2004
67	Main St / H St	Unsignalized	F	OVFL	1611	F	OVFL	2008
68	15th St / G St	-	-	-	-	-	-	-
69	*Main St / G St*	*Signalized*	*D*	*38.6*	*3,271*	*E*	*55.5*	*3,672*
70	18th St / G St	Signalized	B	11.3	1891	B	11.0	1895
71	15th St / D St	-	-	-	-	-	-	-
72	16th St / D St	-	-	-	-	-	-	-

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	2035 Build B					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	Winton Wy / Bellevue Rd	Signalized	C	30.2	3264	D	45.3	3578
2	Atwater Blvd / Applegate Rd	Signalized	D	46.4	3022	F	113.9	4122
3	Sycamore Ave / SR-99 NB Ramps	Unsignalized	A	9.9	727	B	11.3	840
4	Sycamore Ave / Applegate Rd	Signalized	D	38.4	1954	F	140.2	2831
5	Bell Ln / Mall Access / SR-99 SB Ramps	Signalized	C	24.8	1063	C	25.0	1154
6	Bell Dr / Bell Ln	Signalized	C	21.1	1261	C	20.9	1370
7	Bell Dr / Commerce Ave / Applegate Rd	Signalized	C	29.1	2098	C	32.8	2970
8	Mall Access / Applegate Rd	Unsignalized	B	10.1	1635	B	11.0	2469
9	Santa Fe Dr / Buhach Rd / Airdrome Entry	Signalized	C	28.2	2672	C	30.2	2804
10	Buhach Rd / Bellevue Rd	Signalized	C	28.4	1845	C	31.3	2244
11	Ashby Rd / Buhach Rd	Unsignalized	-	-	-	-	-	-
12	Ashby Rd / N 193	Unsignalized	-	-	-	-	-	-
13	Ashby Rd / SR-99 SB Ramps	Unsignalized	-	-	-	-	-	-
14	Santa Fe Dr / Bellevue Rd	Signalized	B	18.2	2536	B	15.5	2938
15	Santa Fe Dr / F St	Signalized	A	8.5	2730	B	12.0	3150
16	Santa Fe Dr / W Ave 2	Unsignalized	F	505.0	3575	F	1969.0	3625
17	Santa Fe Dr / N Franklin Rd	Signalized	E	57.3	3438	D	48.8	3779
18	Ashby Rd / Franklin Rd	All-Way Stop	-	-	-	-	-	-
19	Santa Fe Dr / Belcher Ave	Unsignalized	C	22.4	2729	F	380.2	3306
20	Olive Ave - Santa Fe Dr / SR-59	Signalized	E	57.6	4095	F	136.8	5884
21	Santa Fe Dr/ AM Express WB Ramps	Signalized	D	44.0	4666	D	38.5	5066
22	Santa Fe Dr/ AM Express EB Ramps	Signalized	D	41.6	3613	C	29.1	4053
23	SR-99 NB Ramps/AM Express	Signalized	D	37.4	4277	C	20.3	4011
24	SR-99 SB Ramps/AM Express	Signalized	C	20.9	3566	B	18.9	3750
25	16th St / SR-59	Unsignalized	F	377.3	2589	F	3159.0	3779
26	*13th St - SR-99 SB Off-Ramp / V St*	*Signalized*	*F*	*126.8*	*4090*	*F*	*144.7*	*4431*
27	14th St - SR-99 NB Onramp / V St	Signalized	C	23.8	3218	D	45.1	4221
28	15th St / V St	Signalized	B	17.0	2593	C	28.7	3620
29	16th St / V St	Signalized	E	61.6	3830	F	140.8	4946
30	13th St / R St	Signalized	B	18.7	2893	C	34.6	3453
31	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	23.8	2953	C	28.2	3716
32	15th St / R St	Signalized	B	16.3	2241	C	26.6	3618
33	16th St / R St	Signalized	C	34.6	3559	D	49.5	5494
34	Olive Ave / R St	Signalized	E	59.6	4515	F	115.2	6959
35	15th St / O St	All-Way Stop	A	8.7	559	B	12.2	988
36	16th St / O St	Signalized	C	20.0	1975	C	21.8	3002

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	2035 Build B					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
37	15th St / M St	All-Way Stop	F	266.5	2269	F	479.9	2726
38	*16th St / M St*	*Signalized*	*D*	*43.7*	*3589*	*E*	*74.0*	*5060*
39	Olive Ave / M St	Signalized	F	81.6	5602	F	164.2	7307
40	2nd St / Grogan Ave / Northwest Ave	All-Way Stop	C	17.5	1166	C	18.7	1244
41	Childs Ave / Martin Luther King Wy	Signalized	E	59.0	2366	F	100.2	2897
42	13th St / Martin Luther King Wy	Signalized	C	32.2	2354	D	46.9	2958
43	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	F	277.5	2111	F	326.1	2288
44	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	F	742.0	2005	F	3347.4	2438
45	14th St / Martin Luther King Wy	Unsignalized	F	134.4	1576	F	OVFL	2318
46	15th St / Martin Luther King Wy	-	-	-	-	-	-	-
47	16th St / Martin Luther King Wy	-	-	-	-	-	-	-
48	13th St / G St	All-Way Stop	F	403.2	2609	F	425.3	2985
49	SR-99 - 14th St / G St	Unsignalized	F	116.2	2077	F	506.1	2356
50	16th St / G Street	-	-	-	-	-	-	-
51	Olive Ave / G St	Signalized	F	86.4	5952	F	96.7	6688
52	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	C	18.1	812	B	14.7	652
53	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	235.1	1340	F	172.5	1219
54	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	5203.0	3215	F	14424.0	3245
55	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Signalized	F	268.2	3201	F	208.0	3106
56	14th St / O St	Unsignalized	B	12.4	419	C	23.9	761
57	13th St / M St	All-Way Stop	F	147.9	2006	F	206.6	2228
58	14th St / M St	Unsignalized	F	51.7	1641	F	115.4	1838
59	Main St / M St	Signalized	B	12.0	2975	C	21.0	3559
60	18th St / M St	Signalized	B	13.1	2705	B	14.6	2919
61	15th St / Canal St	All-Way Stop	B	10.4	770	C	18.9	1239
62	16th St / Canal St	Unsignalized	F	233.1	2296	F	1740.0	2841
63	11th St / Martin Luther King Wy	Unsignalized	F	298.8	1901	F	OVFL	2202
64	Main St / Martin Luther King Wy	Signalized	B	12.2	1765	C	31.2	2715
65	18th St / Martin Luther King Wy	All-Way Stop	A	9.0	586	A	9.8	655
66	16th St / H St	Signalized	D	36.0	1706	D	53.6	2000
67	Main St / H St	Unsignalized	F	OVFL	1614	F	OVFL	2011
68	15th St / G St	-	-	-	-	-	-	-
69	*Main St / G St*	*Signalized*	*D*	*39.8*	*3,289*	*E*	*56.7*	*3,689*
70	18th St / G St	Signalized	B	11.3	1892	B	11.1	1896
71	15th St / D St	-	-	-	-	-	-	-
72	16th St / D St	-	-	-	-	-	-	-

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-2 Merced HST Station

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Existing						
			AM Peak			PM Peak		
		Control	LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	16th St / SR-59	Unsignalized	C	9.1	1,360	F	22.9	1,961
2	Olive Ave - Santa Fe Dr / SR-59	Signalized	D	35.4	2,219	D	39.4	3,161
3	***13th St - SR-99 SB Off-Ramp / V St***	***Signalized***	***C***	***32.2***	***2,080***	***C***	***33.1***	***2,311***
4	14th St - SR-99 NB Onramp / V St	Signalized	B	18.6	1,545	B	18.0	1,990
5	15th St / V St	Signalized	B	16.7	1,299	C	25.0	1,867
6	16th St / V St	Signalized	C	21.5	2,067	C	27.0	2,640
7	13th St / R St	Signalized	B	14.3	1,466	B	15.0	1,811
8	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	B	20.0	1,449	B	19.0	1,809
9	15th St / R St	Signalized	B	17.1	1,141	C	25.2	1,892
10	16th St / R St	Signalized	C	31.8	1,838	C	33.7	2,861
11	Olive Ave / R St	Signalized	D	50.9	2,490	E	56.2	3,810
12	15th St / O St	Unsignalized	A	7.6	291	A	8.5	511
13	16th St / O St	Signalized	C	21.1	1,015	B	19.8	1,585
14	15th St / M St	Unsignalized	B	11.0	822	B	12.7	992
15	16th St / M St	Signalized	C	32.9	1,570	C	33.7	2,297
16	Olive Ave / M St	Signalized	D	54.5	3,042	E	58.6	3,971
17	2nd St / Grogan Ave / Northwest Ave	Unsignalized	A	9.8	581	B	10.0	640
18	Childs Ave / Martin Luther King Wy	Signalized	D	39.2	1,231	D	41.2	1,516
19	13th St / Martin Luther King Wy	Signalized	C	25.7	1,149	C	27.4	1,495
20	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	C	5.6	1,138	C	3.8	1,264
21	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	C	3.8	1,104	C	3.1	1,325
22	14th St / Martin Luther King Wy	Unsignalized	C	1.4	871	C	2.2	1,254
23	15th St / Martin Luther King Wy	Signalized	B	12.4	856	B	14.8	1,306
24	***16th St / Martin Luther King Wy***	***Signalized***	***C***	***29.1***	***1,337***	***C***	***31.2***	***2,015***
25	13th St / G St	Signalized	B	12.9	1,021	C	15.4	1,219
26	SR-99 - 14th St / G St	Unsignalized	B	1.3	869	B	1.1	990
27	16th St / G Street	Signalized	C	31.4	1,917	C	32.8	2,374
28	Olive Ave / G St	Signalized	D	46.8	3,187	D	48.0	3,666
29	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	B	6.0	810	D	7.1	1,003
30	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	E	19.1	1,069	F	30.8	1,170
31	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	D	3.1	1,536	F	11.3	1,689
32	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Unsignalized	D	42.6	1,630	D	36.9	1,685
33	14th St / O St	Unsignalized	A	2.6	164	B	3.8	296
34	13th St / M St	Unsignalized	B	12.7	955	C	15.8	1,106
35	14th St / M St	Unsignalized	B	0.9	664	C	1.7	762
36	Main St / M St	Signalized	A	9.7	1,566	B	13.2	1,858
37	18th St / M St	Signalized	B	12.2	1,439	B	13.5	1,555
38	15th St / Canal St	Unsignalized	B	5.1	256	B	7.5	493
39	16th St / Canal St	Unsignalized	C	1.6	1,106	C	2.0	1,447
40	11th St / Martin Luther King Wy	Unsignalized	C	1.9	957	C	3.1	1,119
41	Main St / Martin Luther King Wy	Signalized	A	9.5	513	A	9.9	814
42	18th St / Martin Luther King Wy	Unsignalized	A	7.7	252	A	8.0	347
43	16th St / H St	Unsignalized	B	0.6	731	B	1.0	980
44	Main St / H St	Unsignalized	A	1.5	252	B	2.1	398
45	15th St / G St	Unsignalized	B	1.6	708	C	3.3	910
46	***Main St / G St***	***Signalized***	***B***	***16.8***	***877***	***C***	***20.1***	***919***
47	18th St / G St	Signalized	A	8.5	749	A	4.5	601
48	15th St / D St	Unsignalized	B	8.1	363	B	8.4	364
49	16th St / D St	Unsignalized	A	4.0	670	B	3.4	943

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-2 Merced HST Station

Intersection Control, LOS, Average Delay, and Total V

#	Intersection	2035 No Build						
			AM Peak			PM Peak		
		Control	LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	16th St / SR-59	Unsignalized	F	128.0	2,535	F	747.0	3,720
2	Olive Ave - Santa Fe Dr / SR-59	Signalized	E	56.2	3,997	F	131.5	5,786
3	***13th St - SR-99 SB Off-Ramp / V St***	***Signalized***	***F***	***89.0***	***3,690***	***F***	***113.4***	***4,153***
4	14th St - SR-99 NB Onramp / V St	Signalized	C	23.3	2,977	C	30.7	3,842
5	15th St / V St	Signalized	B	17.2	2,493	C	28.7	3,522
6	16th St / V St	Signalized	E	57.6	3,675	F	132.3	4,786
7	13th St / R St	Signalized	B	17.4	2,631	C	33.0	3,302
8	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	23.1	2,797	C	24.3	3,495
9	15th St / R St	Signalized	B	16.4	2,184	C	26.5	3,565
10	16th St / R St	Signalized	C	33.9	3,372	D	46.7	5,305
11	Olive Ave / R St	Signalized	E	59.5	4,499	F	114.5	6,943
12	15th St / O St	Unsignalized	A	8.6	543	B	11.5	937
13	16th St / O St	Signalized	C	21.0	1,795	C	22.1	2,819
14	15th St / M St	Unsignalized	F	67.4	1,574	F	145.6	1,864
15	16th St / M St	Signalized	D	36.0	2,894	D	43.8	4,208
16	Olive Ave / M St	Signalized	F	81.4	5,586	F	163.2	7,291
17	2nd St / Grogan Ave / Northwest Ave	Unsignalized	C	16.6	1,081	C	16.9	1,159
18	Childs Ave / Martin Luther King Wy	Signalized	E	56.7	2,302	F	93.1	2,833
19	13th St / Martin Luther King Wy	Signalized	C	26.8	2,122	C	32.7	2,745
20	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	F	79.2	2,061	F	73.2	2,348
21	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	F	93.1	2,115	F	115.7	2,559
22	14th St / Martin Luther King Wy	Unsignalized	F	3.2	1,651	F	43.1	2,362
23	15th St / Martin Luther King Wy	Signalized	B	13.9	1,632	B	17.6	2,470
24	***16th St / Martin Luther King Wy***	***Signalized***	***C***	***33.3***	***2,418***	***F***	***80.5***	***3,605***
25	13th St / G St	Signalized	F	125.8	1,915	F	190.6	2,293
26	SR-99 - 14th St / G St	Unsignalized	E	2.6	1,670	E	2.5	1,902
27	16th St / G Street	Signalized	D	39.7	3,581	D	51.6	4,360
28	Olive Ave / G St	Signalized	F	86.0	5,935	F	96.4	6,671
29	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	C	7.1	1,501	F	33.1	1,728
30	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	341.6	1,922	F	465.6	2,107
31	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	111.8	2,960	F	OVFL	3,217
32	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Unsignalized	F	232.2	2,935	F	200.6	3,073
33	14th St / O St	Unsignalized	B	2.7	303	B	4.6	543
34	13th St / M St	Unsignalized	F	70.2	1,691	F	136.2	1,955
35	14th St / M St	Unsignalized	D	1.5	1,224	E	3.7	1,401
36	Main St / M St	Signalized	B	11.8	2,881	B	18.7	3,394
37	18th St / M St	Signalized	B	13.0	2,667	B	14.4	2,881
38	15th St / Canal St	Unsignalized	B	5.6	456	C	11.8	872
39	16th St / Canal St	Unsignalized	E	3.8	1,898	F	18.5	2,452
40	11th St / Martin Luther King Wy	Unsignalized	F	8.7	1,770	F	OVFL	2,068
41	Main St / Martin Luther King Wy	Signalized	A	9.9	924	B	10.9	1,433
42	18th St / Martin Luther King Wy	Unsignalized	A	8.6	464	A	9.6	633
43	16th St / H St	Unsignalized	C	0.9	1,250	D	1.7	1,647
44	Main St / H St	Unsignalized	B	1.8	443	B	2.8	686
45	15th St / G St	Unsignalized	D	2.5	1,299	F	17.5	1,649
46	***Main St / G St***	***Signalized***	***B***	***18.3***	***1,604***	***C***	***21.2***	***1,646***
47	18th St / G St	Signalized	A	9.2	1,382	A	4.5	1,105
48	15th St / D St	Unsignalized	D	9.8	682	C	10.0	667
49	16th St / D St	Unsignalized	B	5.1	1,170	C	5.3	1,589

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-2 Merced HST Station

Intersection Control, LOS, Average Delay, and Total V

#	Intersection	2035 Build						
			AM Peak			PM Peak		
		Control	LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	16th St / SR-59	Unsignalized	F	377.3	2,589	F	3159.0	3,779
2	Olive Ave - Santa Fe Dr / SR-59	Signalized	E	56.7	4,022	F	132.8	5,811
3	***13th St - SR-99 SB Off-Ramp / V St***	***Signalized***	***F***	***120.7***	***4,049***	***F***	***136.9***	***4,368***
4	14th St - SR-99 NB Onramp / V St	Signalized	C	23.6	3,185	D	42.3	4,220
5	15th St / V St	Signalized	B	17.1	2,551	C	28.7	3,580
6	16th St / V St	Signalized	E	59.4	3,787	F	137.2	4,903
7	13th St / R St	Signalized	B	18.9	2,942	D	35.3	3,464
8	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	24.1	3,016	C	30.6	3,800
9	15th St / R St	Signalized	B	16.2	2,289	C	26.6	3,633
10	16th St / R St	Signalized	C	34.6	3,551	D	49.3	5,487
11	Olive Ave / R St	Signalized	E	59.6	4,515	F	115.2	6,959
12	15th St / O St	Unsignalized	A	9.0	612	B	12.5	1,013
13	16th St / O St	Signalized	C	20.1	1,966	C	21.8	2,991
14	15th St / M St	Unsignalized	F	251.2	2,195	F	340.5	2,483
15	16th St / M St	Signalized	D	39.6	3,345	D	52.7	4,659
16	Olive Ave / M St	Signalized	F	81.6	5,602	F	164.2	7,307
17	2nd St / Grogan Ave / Northwest Ave	Unsignalized	C	16.6	1,081	C	16.9	1,159
18	Childs Ave / Martin Luther King Wy	Signalized	E	58.0	2,360	F	97.9	2,891
19	13th St / Martin Luther King Wy	Signalized	C	28.6	2,280	D	37.1	2,891
20	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	F	496.0	2,272	F	601.3	2,487
21	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	F	1069.8	2,238	F	6413.6	2,695
22	14th St / Martin Luther King Wy	Unsignalized	F	376.0	1,847	F	OVFL	2,614
23	15th St / Martin Luther King Wy	Signalized	B	12.5	1,606	B	16.0	2,374
24	***16th St / Martin Luther King Wy***	***Signalized***	***D***	***37.7***	***2,827***	***F***	***117.9***	***4,014***
25	13th St / G St	Signalized	F	392.3	2,582	F	419.7	2,960
26	SR-99 - 14th St / G St	Unsignalized	F	121.5	2,059	F	501.0	2,337
27	16th St / G Street	-	-	-	-	-	-	-
28	Olive Ave / G St	Signalized	F	86.3	5,952	F	96.7	6,688
29	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	C	18.2	821	B	15.0	661
30	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	242.5	1,349	F	179.1	1,228
31	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	5271.0	3,215	F	14621.0	3,245
32	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Unsignalized	F	268.2	3,201	F	208.0	3,106
33	14th St / O St	Unsignalized	B	12.7	439	E	35.1	846
34	13th St / M St	Unsignalized	F	142.8	1,978	F	183.0	2,140
35	14th St / M St	Unsignalized	F	55.7	1,735	F	196.0	1,902
36	Main St / M St	Signalized	B	11.8	2,921	B	19.1	3,434
37	18th St / M St	Signalized	B	13.1	2,703	B	14.6	2,917
38	15th St / Canal St	Unsignalized	C	22.2	837	F	OVFL	1,253
39	16th St / Canal St	Unsignalized	F	265.2	2,307	F	2494.0	2,861
40	11th St / Martin Luther King Wy	Unsignalized	F	143.0	1,826	F	OVFL	2,124
41	Main St / Martin Luther King Wy	Signalized	A	9.9	928	B	10.9	1,437
42	18th St / Martin Luther King Wy	Unsignalized	A	8.7	484	A	9.7	653
43	16th St / H St	Unsignalized	D	35.9	1,709	D	50.1	2,242
44	Main St / H St	Unsignalized	F	OVFL	1,611	F	OVFL	2,008
45	15th St / G St	-	-	-	-	-	-	-
46	***Main St / G St***	***Signalized***	***D***	***38.6***	***3,271***	***E***	***55.5***	***3,672***
47	18th St / G St	Signalized	B	11.3	1,891	B	11.0	1,895
48	15th St / D St	-	-	-	-	-	-	-
49	16th St / D St	-	-	-	-	-	-	-

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-2 Merced HST Station

Intersection Control, LOS, Average Delay, and Total V

#	Intersection	2035 Build						
			AM Peak			PM Peak		
		Control	LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	16th St / SR-59	Unsignalized	F	377.3	2,589	F	3159.0	3,779
2	Olive Ave - Santa Fe Dr / SR-59	Signalized	E	56.7	4,022	F	132.8	5,811
3	***13th St - SR-99 SB Off-Ramp / V St***	***Signalized***	***F***	***126.8***	***4,090***	***F***	***144.7***	***4,431***
4	14th St - SR-99 NB Onramp / V St	Signalized	C	23.8	3,218	D	45.1	4,221
5	15th St / V St	Signalized	B	17.0	2,593	C	28.7	3,620
6	16th St / V St	Signalized	E	61.6	3,830	F	140.8	4,946
7	13th St / R St	Signalized	B	18.7	2,893	C	34.6	3,453
8	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	23.8	2,953	C	28.2	3,716
9	15th St / R St	Signalized	B	16.3	2,241	C	26.6	3,618
10	16th St / R St	Signalized	C	34.6	3,559	D	49.5	5,494
11	Olive Ave / R St	Signalized	E	59.6	4,515	F	115.2	6,959
12	15th St / O St	All-Way Stop	A	8.7	559	B	12.2	988
13	16th St / O St	Signalized	C	20.0	1,975	C	21.8	3,002
14	15th St / M St	All-Way Stop	F	176.3	1,985	F	291.0	2,275
15	16th St / M St	Signalized	D	39.5	3,340	D	52.3	4,656
16	Olive Ave / M St	Signalized	F	81.6	5,602	F	164.2	7,307
17	2nd St / Grogan Ave / Northwest Ave	All-Way Stop	C	17.5	1,166	C	18.7	1,244
18	Childs Ave / Martin Luther King Wy	Signalized	E	59.0	2,366	F	100.2	2,897
19	13th St / Martin Luther King Wy	Signalized	C	28.4	2,354	D	37.0	2,958
20	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	F	386.1	2,269	F	563.5	2,539
21	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	F	998.5	2,163	F	OVFL	2,689
22	14th St / Martin Luther King Wy	Unsignalized	F	136.5	1,750	F	OVFL	2,546
23	15th St / Martin Luther King Wy	Signalized	B	12.7	1,635	B	16.5	2,403
24	***16th St / Martin Luther King Wy***	***Signalized***	***D***	***37.6***	***2,824***	***F***	***117.7***	***4,011***
25	13th St / G St	All-Way Stop	F	403.2	2,609	F	425.3	2,985
26	SR-99 - 14th St / G St	Unsignalized	F	116.2	2,077	F	506.1	2,356
27	16th St / G Street	-	-	-	-	-	-	-
28	Olive Ave / G St	Signalized	F	86.4	5,952	F	96.7	6,688
29	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	C	18.1	812	B	14.7	652
30	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	235.1	1,340	F	172.5	1,219
31	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	5203.0	3,215	F	14424.0	3,245
32	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Signalized	F	268.2	3,201	F	208.0	3,106
33	14th St / O St	Unsignalized	B	12.4	419	C	23.9	761
34	13th St / M St	All-Way Stop	F	140.7	1,968	F	180.7	2,133
35	14th St / M St	Unsignalized	E	47.8	1,603	F	88.2	1,743
36	Main St / M St	Signalized	B	11.8	2,918	B	18.9	3,431
37	18th St / M St	Signalized	B	13.1	2,705	B	14.6	2,919
38	15th St / Canal St	Unsignalized	B	14.5	618	E	38.6	1,034
39	16th St / Canal St	Unsignalized	F	264.1	2,304	F	2456.0	2,858
40	11th St / Martin Luther King Wy	Unsignalized	F	298.8	1,901	F	OVFL	2,202
41	Main St / Martin Luther King Wy	Signalized	A	9.9	926	B	10.9	1,435
42	18th St / Martin Luther King Wy	All-Way Stop	A	8.7	486	A	9.8	655
43	16th St / H St	Signalized	D	36.0	1,706	D	50.6	2,238
44	Main St / H St	Unsignalized	F	OVFL	1,614	F	OVFL	2,011
45	15th St / G St	-	-	-	-	-	-	-
46	***Main St / G St***	***Signalized***	***D***	***39.8***	***3,289***	***E***	***56.7***	***3,689***
47	18th St / G St	Signalized	B	11.3	1,892	B	11.1	1,896
48	15th St / D St	-	-	-	-	-	-	-
49	16th St / D St	-	-	-	-	-	-	-

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-3 Herndon Ave and Shaw Ave Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

		Existing						
			AM PEAK HOUR			PM PEAK HOUR		
#	Intersection	Control	LOS	Delay	Total Volume (AM)	LOS	Delay	Total Volume (PM)
1	GOLDEN STATE BLVD / SANTA ANA AVE	1-WAY STOP*	C	18.8	1,359	C	16.2	1,695
2	CORNELIA AVE / SANTA ANA AVE	Yield	A	7.0	23	A	6.8	11
5	CORNELIA AVE / SHAW AVE	2-WAY STOP*	E	36.4	1,987	E	44.9	2,161
6	GOLDEN STATE BLVD / SHAW AVE	SIGNAL	D	43.8	2,968	E	76.9	3,646
7	BLYTHE AVE / SHAW AVE	SIGNAL	D	36.4	1,692	F	127.8	3,561
8	BRAWLEY AVE / SHAW AVE	SIGNAL	D	38.9	3,296	E	64.5	5,284
9	CORNELIA AVE / GOLDEN STATE BLVD	1-WAY STOP*	C	18.5	1,121	D	30.9	949
10	FIGARDEN DR / GATES AVE	SIGNAL	B	15.8	2,190	C	21.2	2,961
11	FIGARDEN DR / BULLARD AVE	SIGNAL	D	45.6	2,788	D	43.0	3,246
12	DANTE AVE / BULLARD AVE	ALL-WAY STOP	B	10.9	825	B	10.6	961
13	POLK AVE / BULLARD AVE	ALL-WAY STOP	B	10.9	698	B	11.7	974
14	CARNEGIE AVE / BULLARD AVE	ALL-WAY STOP	C	16.8	942	C	21.7	972
15	GOLDEN STATE BLVD / CARNEGIE AVE	ALL-WAY STOP	E	45.7	951	C	23.3	1,113
16	*VETERANS BLVD / BULLARD AVE*	-	-	-	-	-	-	-
17	*VETERANS BLVD / GOLDEN STATE BLVD CONNECTOR SOUTH*	-	-	-	-	-	-	-
18	VETERANS BLVD / SR 99 NB RAMPS	-	-	-	-	-	-	-
19	VETERANS BLVD / SR 99 SB RAMPS	-	-	-	-	-	-	-

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-3 Herndon Ave and Shaw Ave Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

		2035 No Build						
			AM PEAK HOUR			PM PEAK HOUR		
#	Intersection	Control	LOS	Delay	Total Volume (AM)	LOS	Delay	Total Volume (PM)
1	GOLDEN STATE BLVD / SANTA ANA AVE	1-WAY STOP*	E	48.2	2,140	F	76.9	2,382
2	CORNELIA AVE / SANTA ANA AVE	Yield	A	7.2	67	A	6.8	21
5	CORNELIA AVE / SHAW AVE	2-WAY STOP*	F	217.6	3,203	F	437.7	3,374
6	GOLDEN STATE BLVD / SHAW AVE	SIGNAL	E	75.9	4,777	F	205.9	5,998
7	BLYTHE AVE / SHAW AVE	SIGNAL	E	55.2	2,985	F	455.2	6,225
8	BRAWLEY AVE / SHAW AVE	SIGNAL	D	44.5	4,595	F	131.0	7,295
9	CORNELIA AVE / GOLDEN STATE BLVD	1-WAY STOP*	E	40.6	1,359	F	61.4	1,351
10	FIGARDEN DR / GATES AVE	SIGNAL	B	18.9	2,387	C	21.2	3,222
11	FIGARDEN DR / BULLARD AVE	SIGNAL	F	95.1	3,791	F	148.1	5,021
12	DANTE AVE / BULLARD AVE	ALL-WAY STOP	D	25.6	1,970	C	17.5	1,784
13	POLK AVE / BULLARD AVE	ALL-WAY STOP	E	36.6	1,813	D	31.1	1,980
14	CARNEGIE AVE / BULLARD AVE	ALL-WAY STOP	E	44.4	1,731	F	187.1	2,080
15	GOLDEN STATE BLVD / CARNEGIE AVE	ALL-WAY STOP	F	105.7	1,729	F	229.8	2,354
16	***VETERANS BLVD / BULLARD AVE***	***SIGNAL***	***E***	***74.1***	***7,150***	***E***	***72.4***	***7,550***
17	***VETERANS BLVD / GOLDEN STATE BLVD CONNECTOR SOUTH***	***SIGNAL***	***C***	***27.3***	***7,210***	***E***	***80.0***	***7,560***
18	VETERANS BLVD / SR 99 NB RAMPS	SIGNAL	C	31.5	8,050	C	28.7	7,830
19	VETERANS BLVD / SR 99 SB RAMPS	SIGNAL	B	18.7	7,450	E	59.1	7,810

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-3 Herndon Ave and Shaw Ave Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

		2035 Build						
			AM PEAK HOUR			PM PEAK HOUR		
#	Intersection	Control	LOS	Delay	Total Volume (AM)	LOS	Delay	Total Volume (PM)
1	GOLDEN STATE BLVD / SANTA ANA AVE	1-WAY STOP*	F	394.5	2,140	F	OVFL	2,982
2	CORNELIA AVE / SANTA ANA AVE	Yield	F	72.7	1,237	F	300.1	1,798
5	CORNELIA AVE / SHAW AVE	2-WAY STOP*	F	OVFL	4,492	F	OVFL	5,394
6	GOLDEN STATE BLVD / SHAW AVE	SIGNAL	NA	NA	NA	NA	NA	NA
7	BLYTHE AVE / SHAW AVE	SIGNAL	E	56.8	3,081	F	696.1	6,301
8	BRAWLEY AVE / SHAW AVE	SIGNAL	D	44.5	4,595	F	124.3	7,295
9	CORNELIA AVE / GOLDEN STATE BLVD	1-WAY STOP*	E	35.2	1,348	F	78.7	1,340
10	FIGARDEN DR / GATES AVE	SIGNAL	B	19.8	2,483	C	34.2	3,298
11	FIGARDEN DR / BULLARD AVE	SIGNAL	F	114.7	3,888	F	190.2	5,098
12	DANTE AVE / BULLARD AVE	ALL-WAY STOP	D	26.8	1,979	C	17.9	1,783
13	POLK AVE / BULLARD AVE	ALL-WAY STOP	D	34.5	1,708	D	28.3	1,924
14	CARNEGIE AVE / BULLARD AVE	ALL-WAY STOP	C	22.2	1,116	F	76.9	1,846
15	GOLDEN STATE BLVD / CARNEGIE AVE	1-WAY STOP*	D	25.1	1,334	F	72.8	1,834
16	***VETERANS BLVD / BULLARD AVE***	***SIGNAL***	***F***	***182.2***	***8,400***	***F***	***235.6***	***9,309***
17	***VETERANS BLVD / GOLDEN STATE BLVD CONNECTOR SOUTH***	***SIGNAL***	***F***	***287.8***	***8,315***	***F***	***553.0***	***9,210***
18	VETERANS BLVD / SR 99 NB RAMPS	SIGNAL	C	31.5	8,050	C	28.7	7,830
19	VETERANS BLVD / SR 99 SB RAMPS	SIGNAL	B	18.7	7,450	E	59.1	7,810

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

D.1-4 SR-99 Realignment Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	2008 Existing						
			AM Peak Hour			PM Peak Hour		
		Control	LOS	Delay (sec)	Volume (veh)	LOS	Delay (sec)	Volume (veh)
1	McKinley Avenue and Woodson Avenue	U*	B	12	538	B	14	699
2	McKinley Avenue and SR-99 SB Ramp	U*	A	10	1031	A	9	955
3	McKinley Avenue and SR-99 NB Ramp	U*	C	17	1006	C	16	1048
4	McKinley Avenue and Motel Drive	S	B	15	1221	B	14	1457
5	***Clinton Avenue and Brawley Avenue***	***S***	***B***	***15***	***1289***	***B***	***20***	***1765***
6	***Clinton Avenue and Marks Avenue***	***S***	***C***	***34***	***1888***	***D***	***45***	***2568***
7	Clinton Avenue and Vassar Avenue	U*	F	391	2087	F	487	2585
9	Clinton Avenue and SR-99 SB Ramps	Does not Exist						
10	Clinton Avenue and SR-99 NB Ramps	S	A	10	2244	B	13	3141
11	***Clinton Avenue and Weber Avenue***	***S***	***D***	***36***	***2117***	***E***	***64***	***2835***
12	Princeton Avenue and SR-99 SB Ramp/Parkway Drive	U*	A	9	98	A	9	79
13	Shields Avenue and SR-99 SB Ramp/Parkway Drive	U	B	14	1013	C	22	1088
14	Shields Avenue and Valentine Avenue	U	B	12	699	B	12	813
15	Shields Avenue and Brawley Ave	U	A	9	630	B	13	1028
16	Dakota Avenue and Brawley Avenue	U	B	14	848	C	16	950
18	Ashlan Avenue and SR-99 SB Ramp/Parkway Drive	S	D	38	2108	D	49	2827
19	Ashlan Avenue and SR-99 NB Ramp/Brawley Avenue	S	C	32	2857	E	56	3936
20	Brawley Avenue and Golden State Boulevard	U*	F	81	1358	F	123	1456
21	Golden State Boulevard and Shaw Avenue	S	C	25	2719	D	46	3961

U = Unsignalized, S = Signalized

Intersections selected for analysis are italicized

D.1-4 SR-99 Realignment Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	2035 No-Build						
			AM Peak Hour			PM Peak Hour		
		Control	LOS	Delay (sec)	Volume (veh)	LOS	Delay (sec)	Volume (veh)
1	McKinley Avenue and Woodson Avenue	U*	C	15	795	C	20	1030
2	McKinley Avenue and SR-99 SB Ramp	U*	B	13	1500	B	11	1395
3	McKinley Avenue and SR-99 NB Ramp	U*	F	160	1465	F	177	1530
4	McKinley Avenue and Motel Drive	S	B	17	1805	B	16	2135
5	***Clinton Avenue and Brawley Avenue***	***S***	***C***	***26***	***2890***	***D***	***42***	***3960***
6	***Clinton Avenue and Marks Avenue***	***S***	***F***	***163***	***3950***	***F***	***108***	***3535***
7	Clinton Avenue and Vassar Avenue	U*	F	High	2087	F	High	2585
9	Clinton Avenue and SR-99 SB Ramps	Does not Exist						
10	Clinton Avenue and SR-99 NB Ramps	S	C	28	4160	C	23	4040
11	***Clinton Avenue and Weber Avenue***	***S***	***F***	***107***	***4515***	***F***	***97***	***3775***
12	Princeton Avenue and SR-99 SB Ramp/Parkway Drive	U*	A	9	98	A	9	79
13	Shields Avenue and SR-99 SB Ramp/Parkway Drive	U	F	150	1013	F	103	1088
14	Shields Avenue and Valentine Avenue	U	F	209	1575	F	195	1830
15	Shields Avenue and Brawley Ave	U	C	23	1355	F	155	2175
16	Dakota Avenue and Brawley Avenue	U	F	245	1910	F	339	2145
18	Ashlan Avenue and SR-99 SB Ramp/Parkway Drive	S	F	766	6095	F	547	7180
19	Ashlan Avenue and SR-99 NB Ramp/Brawley Avenue	S	E	74	3765	E	75	4290
20	Brawley Avenue and Golden State Boulevard	U*	F	811	1765	F	1422	1895
21	Golden State Boulevard and Shaw Avenue	S	E	63	4665	F	298	6800

U = Unsignalized, S = Signalized

Intersections selected for analysis are italicized

D.1-4 SR-99 Realignment Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	2035 Build						
			AM Peak Hour			PM Peak Hour		
		Control	LOS	Delay (sec)	Volume (veh)	LOS	Delay (sec)	Volume (veh)
1	McKinley Avenue and Woodson Avenue	U*	B	13	839	C	18	1074
2	McKinley Avenue and SR-99 SB Ramp	U*	B	12	1471	B	11	1373
3	McKinley Avenue and SR-99 NB Ramp	U*	F	125	1436	F	144	1508
4	McKinley Avenue and Motel Drive	S	B	17	1776	B	16	2113
5	***Clinton Avenue and Brawley Avenue***	***S***	***D***	***43***	***3232***	***E***	***63***	***4236***
6	***Clinton Avenue and Marks Avenue***	***S***	***F***	***288***	***5171***	***F***	***203***	***4639***
7	Clinton Avenue and Vassar Avenue	U*	F	High	4370	D	34	4030
9	Clinton Avenue and SR-99 SB Ramps	S	E	74	5642	B	20	4799
10	Clinton Avenue and SR-99 NB Ramps	S	C	27	4758	C	21	3677
11	***Clinton Avenue and Weber Avenue***	***S***	***F***	***138***	***5080***	***F***	***106***	***3400***
12	Princeton Avenue and SR-99 SB Ramp/Parkway Drive	Intersection removed as part						
13	Shields Avenue and SR-99 SB Ramp/Parkway Drive	Intersection removed as part						
14	Shields Avenue and Valentine Avenue	U	F	52	1369	F	109	1930
15	Shields Avenue and Brawley Ave	U	D	28	1376	F	193	2238
16	Dakota Avenue and Brawley Avenue	U	F	294	2113	F	708	2694
18	Ashlan Avenue and SR-99 SB Ramp/Parkway Drive	S	F	736	6363	F	579	7803
19	Ashlan Avenue and SR-99 NB Ramp/Brawley Avenue	S	E	74	3765	E	75	4290
20	Brawley Avenue and Golden State Boulevard	U*	F	811	1765	F	1422	1895
21	Golden State Boulevard and Shaw Avenue	S	E	63	4665	F	298	6800

U = Unsignalized, S = Signalized

Intersections selected for analysis are italicized

D.1-4 SR-99 Realignment Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	2035 Build with Mitigation						
			AM Peak Hour			PM Peak Hour		
		Control	LOS	Delay (sec)	Volume (veh)	LOS	Delay (sec)	Volume (veh)
1	McKinley Avenue and Woodson Avenue	U*	B	13	839	C	18	1074
2	McKinley Avenue and SR-99 SB Ramp	U*	B	12	1471	B	11	1373
3	McKinley Avenue and SR-99 NB Ramp	U*	F	125	1436	F	144	1508
4	McKinley Avenue and Motel Drive	S	B	17	1776	B	16	2113
5	***Clinton Avenue and Brawley Avenue***	***S***	***C***	***29***	***3232***	***D***	***44***	***4236***
6	***Clinton Avenue and Marks Avenue***	***S***	***F***	***161***	***5171***	***F***	***93***	***4639***
7	Clinton Avenue and Vassar Avenue	U*	F	High	4370	D	34	4030
9	Clinton Avenue and SR-99 SB Ramps	S	D	49	5642	B	19	4799
10	Clinton Avenue and SR-99 NB Ramps	S	C	27	4758	C	21	3677
11	***Clinton Avenue and Weber Avenue***	***S***	***F***	***88***	***5080***	***D***	***41***	***3400***
12	Princeton Avenue and SR-99 SB Ramp/Parkway Drive	of the project improvements						
13	Shields Avenue and SR-99 SB Ramp/Parkway Drive	of the project improvements						
14	Shields Avenue and Valentine Avenue	U	F	52	1369	F	109	1930
15	Shields Avenue and Brawley Ave	S	A	10	1376	B	18	2238
16	Dakota Avenue and Brawley Avenue	S	C	25	2113	D	43	2694
18	Ashlan Avenue and SR-99 SB Ramp/Parkway Drive	S	F	515	6363	F	496	7803
19	Ashlan Avenue and SR-99 NB Ramp/Brawley Avenue	S	E	74	3765	E	75	4290
20	Brawley Avenue and Golden State Boulevard	U*	F	811	1765	F	1422	1895
21	Golden State Boulevard and Shaw Avenue	S	E	63	4665	F	298	6800

U = Unsignalized, S = Signalized

Intersections selected for analysis are italicized

D.2-1 2009 EMFAC Runs

Title : CO Winter for CALINE 0 to 20 mph
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/19 15:14:02
Scen Year: 2009 -- All model years in the range 1965 to 2009 selected
Season : Winter
Area : San Joaquin Valley Unified APCD
****

Year: 2009 -- Model Years 1965 to 2009 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Carbon Monoxide Temperature: 49F Relative Humidity: 72%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0	0	24.188	62.416	0	0	12.311
1	6.787	9.994	10.833	23.19	35.205	42.579	11.053
2	6.787	9.994	10.833	23.19	35.205	42.579	11.053
3	6.65	9.773	10.646	23.19	35.205	42.579	10.904
4	6.392	9.357	10.295	23.19	35.205	42.579	10.622
5	6.153	8.973	9.971	23.19	35.205	42.579	10.362
6	5.93	8.612	9.452	21.715	32.21	40.812	9.859
7	5.722	8.278	8.977	20.337	29.537	39.196	9.392
8	5.528	7.968	8.543	19.05	27.148	37.72	8.958
9	5.347	7.679	8.146	17.848	25.009	36.371	8.555
10	5.178	7.41	7.781	16.725	23.09	35.14	8.179
11	5.019	7.159	7.446	15.677	21.368	34.017	7.83
12	4.87	6.924	7.137	14.7	19.818	32.996	7.505
13	4.73	6.705	6.852	13.79	18.423	32.067	7.202
14	4.598	6.5	6.59	12.943	17.165	31.226	6.919
15	4.474	6.307	6.346	12.158	16.029	30.467	6.656
16	4.356	6.126	6.121	11.432	15.003	29.784	6.412
17	4.246	5.957	5.913	10.762	14.073	29.173	6.184
18	4.141	5.797	5.719	10.148	13.232	28.63	5.973
19	4.042	5.647	5.539	9.57	12.468	28.152	5.774
20	3.948	5.505	5.371	9.202	11.776	27.736	5.612

Title : CO Winter for CALINE 21 to 40 mph
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/19 15:14:02
Scen Year: 2009 -- All model years in the range 1965 to 2009 selected
Season : Winter
Area : San Joaquin Valley Unified APCD
****

Year: 2009 -- Model Years 1965 to 2009 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Carbon Monoxide Temperature: 49F Relative Humidity: 72%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
21	3.859	5.372	5.215	8.852	11.147	27.38	5.46
22	3.775	5.246	5.07	8.52	10.576	27.081	5.317
23	3.695	5.128	4.934	8.204	10.056	26.837	5.181
24	3.619	5.016	4.808	7.905	9.584	26.647	5.054
25	3.547	4.91	4.69	7.62	9.154	26.511	4.934
26	3.479	4.811	4.58	7.35	8.764	26.427	4.821
27	3.414	4.717	4.478	7.093	8.409	26.395	4.715
28	3.353	4.629	4.382	6.85	8.086	26.415	4.615
29	3.294	4.545	4.293	6.618	7.794	26.487	4.521
30	3.239	4.467	4.21	6.399	7.529	26.612	4.433
31	3.186	4.393	4.133	6.191	7.289	26.79	4.35
32	3.136	4.324	4.061	5.995	7.073	27.024	4.273
33	3.089	4.259	3.995	5.809	6.879	27.314	4.201
34	3.044	4.198	3.933	5.634	6.705	27.662	4.134
35	3.002	4.141	3.877	5.469	6.551	28.072	4.073
36	2.963	4.088	3.825	5.315	6.414	28.545	4.016
37	2.925	4.039	3.777	5.17	6.294	29.085	3.964
38	2.89	3.994	3.734	5.035	6.191	29.696	3.917
39	2.858	3.953	3.696	4.909	6.103	30.381	3.874
40	2.828	3.915	3.661	4.793	6.029	31.146	3.837

D.2-2 2035 EMFAC Runs

Title : CO Winter for CALINE 0 to 20 mph
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/19 15:14:02
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Winter
Area : San Joaquin Valley Unified APCD
****

Year: 2035 -- Model Years 1991 to 2035 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Carbon Monoxide Temperature: 49F Relative Humidity: 72%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
0	0	0	23.484	53.334	0	0	10.677
1	0.832	1.333	1.907	5.901	22.729	26.089	2.111
2	0.832	1.333	1.907	5.901	22.729	26.089	2.111
3	0.824	1.321	1.891	5.901	22.729	26.089	2.102
4	0.809	1.295	1.86	5.901	22.729	26.089	2.083
5	0.794	1.271	1.829	5.901	22.729	26.089	2.065
6	0.779	1.247	1.779	5.386	20.813	25.159	1.962
7	0.764	1.223	1.732	4.911	19.102	24.302	1.865
8	0.75	1.2	1.688	4.472	17.571	23.512	1.775
9	0.737	1.178	1.645	4.069	16.199	22.784	1.692
10	0.723	1.156	1.605	3.7	14.968	22.112	1.615
11	0.71	1.135	1.567	3.363	13.861	21.494	1.543
12	0.697	1.115	1.53	3.058	12.866	20.924	1.477
13	0.685	1.094	1.495	2.783	11.969	20.401	1.417
14	0.673	1.075	1.462	2.538	11.159	19.919	1.361
15	0.661	1.056	1.43	2.321	10.428	19.478	1.311
16	0.649	1.037	1.4	2.132	9.766	19.075	1.265
17	0.638	1.019	1.37	1.97	9.167	18.706	1.224
18	0.627	1.001	1.342	1.835	8.624	18.372	1.187
19	0.616	0.984	1.315	1.719	8.132	18.069	1.154
20	0.606	0.967	1.289	1.666	7.685	17.797	1.13

Title : CO Winter for CALINE 21 to 40 mph
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/10/19 15:14:02
Scen Year: 2035 -- All model years in the range 1991 to 2035 selected
Season : Winter
Area : San Joaquin Valley Unified APCD
****

Year: 2035 -- Model Years 1991 to 2035 Inclusive -- Winter
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Carbon Monoxide Temperature: 49F Relative Humidity: 72%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
21	0.595	0.95	1.264	1.617	7.278	17.555	1.108
22	0.585	0.934	1.24	1.571	6.909	17.34	1.087
23	0.575	0.918	1.216	1.53	6.573	17.154	1.067
24	0.566	0.903	1.194	1.492	6.268	16.994	1.048
25	0.557	0.888	1.172	1.457	5.99	16.86	1.03
26	0.547	0.873	1.151	1.426	5.737	16.752	1.013
27	0.538	0.859	1.13	1.396	5.508	16.67	0.997
28	0.53	0.845	1.11	1.37	5.299	16.613	0.982
29	0.521	0.832	1.091	1.346	5.109	16.583	0.968
30	0.513	0.818	1.073	1.324	4.938	16.578	0.954
31	0.505	0.805	1.055	1.305	4.783	16.599	0.942
32	0.497	0.792	1.037	1.287	4.643	16.648	0.93
33	0.489	0.78	1.02	1.272	4.517	16.724	0.919
34	0.481	0.768	1.004	1.258	4.405	16.828	0.909
35	0.474	0.756	0.988	1.247	4.305	16.962	0.9
36	0.467	0.745	0.972	1.237	4.216	17.127	0.891
37	0.46	0.733	0.957	1.228	4.139	17.324	0.883
38	0.453	0.722	0.943	1.221	4.072	17.555	0.876
39	0.446	0.711	0.929	1.216	4.016	17.822	0.87
40	0.439	0.701	0.915	1.213	3.968	18.127	0.864

APPENDIX E

Existing Conditions

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E.1 Existing Conditions Plus Project Analysis

TECHNICAL MEMORANDUM

Existing Conditions Plus Project Analysis

This technical memorandum (TM) summarizes the air quality analysis conducted for the Existing Conditions Plus Project against the Existing Conditions.

1.0 Purpose and Approach

Per California Environmental Quality Act (CEQA) requirements, an Environmental Impact Report (EIR) must include a description of the existing physical environmental conditions in the vicinity of the project. Those conditions, in turn, "will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." (CEQA Guidelines §15125[a]).

However, for a project, such as the California High-Speed Train (HST) Project, that would not commence operation for almost 10 years and would not reach full operation for almost 25 years, use of only existing conditions as a baseline for air quality impacts would be misleading. It is more likely that existing background traffic volumes, background roadway changes from other programmed traffic improvement projects, and vehicle emission factors would change between today and 2020/2035 than it is that existing conditions would remain unchanged over the next 10 to 25 years. For example, Regional Transportation Plans (RTPs) include funded transportation projects that are programmed to be constructed by 2035. To ignore that these projects would be in place before the HST project reaches maturity (i.e., the point/year at which HST-related traffic emissions reach their maximum), and to evaluate the HST project's air quality impacts ignoring that these RTP improvements would change the underlying background conditions to which HST project traffic would be added, would be misleading because it would represent a hypothetical comparison.

Therefore, the air quality analysis uses a dual baseline approach. That is, the HST project's air quality impacts are evaluated both against existing conditions and against background (i.e., No Project) conditions as they are expected to be in 2035. This approach complies with CEQA. (See *Woodwark Park Homeowners Ass'n v. City of Fresno* (2007), 150 Cal.App.4th 683, 707 and *Sunnyvale West Neighborhood Assn. v. City of Sunnyvale* (2010), 190 Cal.App.4th 1351). Results for both baselines are presented. The results comparing the project with the future expected baseline are presented in detail in the main text of the air quality section. The results comparing the project with existing conditions are presented in the main text in summary format; details (including mitigation) are presented in this TM. This approach complies with CEQA. It informs the public of potential project impacts under both baselines, but focuses the analysis on the baseline analysis more likely to occur.

Using the air quality analysis methodologies described in the *Merced to Fresno Section Air Quality and Global Climate Change Technical Report* (Authority and FRA 2011a), the impacts of the proposed project have been evaluated and are discussed in the following sections of this TM.

2.0 Methodology

The Existing Conditions Plus Project versus Existing Conditions analysis provides a comparison between the future HST project, not accounting for natural growth and other transportation and program improvement projects in the region in 2035 (Existing Conditions Plus Project), and the existing conditions in 2009 (Existing Conditions).

2.1.1 Construction

There are no future natural growths or other non-HST related improvements included in the project construction impacts presented in the *Merced to Fresno High Speed Train Environmental Impact Report and Environmental Impact Statement (EIR/EIS)* (Authority and FRA 2011b). Therefore, project

construction impacts compared to existing conditions would be the same as discussed in the EIR and EIS. No additional analysis was done for the HST construction-phase analysis.

The comparison of the construction-phase Project to Existing Conditions is included in the EIR/EIS and the main text of the *Merced to Fresno Section Air Quality and Global Climate Change Technical Report* (Authority and FRA 2011a).

2.1.2 Operation

The Existing Conditions Plus Project versus Existing Conditions analysis was conducted for the HST, and includes evaluation of the state, regional, and local impacts.

Operational impacts due to the three Merced to Fresno HST Project Alternatives would be the same. Therefore, the analysis presented below applies to each of the project alternatives evaluated for the Merced to Fresno Section.

The following operational-phase impacts were evaluated for the Existing Conditions Plus Project for comparison to Existing Conditions:

- Criteria and greenhouse gas (GHG) emissions from on-road vehicles, airport emissions, and power requirements
- Mobile source air toxic (MSAT) emissions from on-road vehicles
- Local carbon monoxide (CO) hot spots

The emissions from these sources include the changes from planned traffic improvements and regional growth. Therefore, to evaluate the impacts from Existing Conditions Plus Project, revised traffic information was used in these analyses, which excluded changes from planned traffic improvements and regional growth. Otherwise, the approach used for evaluating the impacts for the Existing Conditions Plus Project are the same as those used to evaluate the Project Alternative and are discussed in the EIR/EIS and *Merced to Fresno Section Air Quality and Global Climate Change Technical Report (*Authority and FRA 2011a).

Operational-phase impacts for the Project compared against existing conditions would be the same as those analyzed in the EIR/EIS for the following sources because no additional non-HST related future improvements were incorporated into the operational conditions evaluated for these facilities:

- Fugitive dust from train movement
- Maintenance facilities onsite equipment operations[1]
- Local particulate matter (PM) hot spots
- Odors

Detailed information regarding the impacts from these sources is included in the EIR/EIS *(*Authority and FRA 2011b) and *Merced to Fresno Section Air Quality and Global Climate Change Technical Report (*Authority and FRA 2011a) and are not discussed further in this TM.

3.0 Statewide and Regional Criteria Emission Analysis

Table 3-1 summarizes statewide emission changes between the Existing Conditions Plus Project and the Existing Conditions. As shown in Table 3-1, the project is predicted to have a beneficial effect on (i.e., reduce) statewide emissions of all criteria pollutants. The analysis estimated the emission changes due to

[1] Potential impacts from localized CO hot spots associated with the heavy maintenance facility (HMF) and train stations were evaluated for the Existing Conditions Plus Project

projected reductions of on-road vehicle miles travelled (VMT) and intrastate air travel, and increases in electrical demand (required to power the HST). Detailed emission data from each source category are presented in the following sections.

Table 3-1
2009 Estimated Statewide Emission Burden Changes due to Existing Conditions Plus Project

Project Element	VOC (tons/year)	CO (tons/year)	NO_x (tons/year)	SO_2 (tons/year)	PM_{10} (tons/year)	$PM_{2.5}$ (tons/year)
Roadways	-1,299	-25,430	-8,873	-29	-442	-329
Aircraft	-135	-1,248	-1,672	-117	-15	-15
Energy (Power Plants)	37	376	252	33	51	47
Total	**-1,397**	**-26,302**	**-10,293**	**-113**	**-406**	**-297**
Note: Totals may not add up exactly due to rounding.						

3.1.1 On-Road Vehicles

As shown in Table 3-2, the HST is predicted to reduce daily roadway VMT by over 17 million miles statewide due to travelers choosing to use the HST rather than drive. As such, it is predicted to reduce statewide roadway emissions by approximately 2%, compared to existing conditions. The on-road vehicle emission analysis is based on VMT changes and associated average daily speed estimates, calculated for each affected county. Emission factors were obtained from EMFAC2007 (CARB, 2007), using parameters set within the program for each individual county to reflect travel within each county and statewide parameters to reflect travel through each county.

Table 3-2
2009 Statewide and County-wide On-Road Vehicle Emission Changes due to HST

County	Existing Daily VMT	Existing Plus Project Daily VMT	Change in Emissions with HST (Tons/year)					
			VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
Fresno County	22,500,000	22,050,000	-37	-650	-391	-0.9	-18	-11
Madera County	4,177,690	4,094,136	-7	-142	-80	-0.2	-4	-4
Merced County	7,000,000	6,860,000	-15	-230	-197	-0.3	-7	-7
Statewide Total	888,400,000	870,632,000	-1,299	-25,430	-8,873	-29	-442	-329
Note: Totals will not add up because additional counties outside of the region area are not presented.								

3.1.2 Airport Emissions

As shown in Table 3-3, the HST is predicted to reduce the number of flights due to travelers choosing to use the HST rather than fly to their destination. Emissions and Dispersion Modeling System (EDMS) was used to estimate aircraft emission factors. EDMS estimated the emissions generated from the projected number of landing and takeoff (LTO) cycles. Along with the emissions from the aircraft themselves, emissions generated from associated ground maintenance activities are also included. Average aircraft

emissions are calculated based on the profile of aircraft currently servicing the San Francisco to Los Angeles corridor. The number of flights removed per day due to the HST was estimated in the travel demand modeling analysis conducted for the project.

Table 3-3
2009 Aircraft Emission Changes due to HST

Origin	No. of Flights Removed per Day	Change in Emission Burdens due to HST (Tons/Year)					
		VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$
Central Coast	-1	0	-3.7	-3.7	-0.5	0	0
Far North	-9	-7.3	-51	-69	-4.7	0	0
Fresno/Madera	0	0	0	0	0	0	0
Kern	-9	-7.3	-51	-69	-4.7	0	0
LA Basin_North	-25	-15	-139	-186	-13	0	0
LA Basin_South	-51	-33	-285	-380	-27	-3.7	-3.7
Merced	-1	0	-3.7	-3.7	-0.5	0	0
Monterey Bay	-9	-7.3	-51	-69	-4.7	0	0
Sacramento Region	-9	-7.3	-51	-69	-4.7	0	0
San Diego Region	-27	-18	-153	-204	-14	0	0
San Joaquin	-4	-3.7	-22	-29	-2.1	0	0
SF Bay Area	-75	-47	-420	-562	-39	-3.7	-3.7
South SJ Valley	0	0	0	0	0	0	0
Stanislaus	-3	0	-15	-22	-1.6	0	0
W. Sierra Nevada	-1	0	-3.7	-3.7	-0.5	0	0
Statewide Total	-224	-135	-1,248	-1,672	-117	-15	-15
Note: Totals may not add up exactly due to rounding.							

3.1.3 Power Plant Emissions

The HST is expected to increase electrical requirements compared to Existing Conditions. The electrical demands due to propulsion of the trains and operation of the trains at terminal stations, in storage depots, in maintenance facilities etc., are conservatively estimated to be 8.24 gigawatt-hours (GWH) per day (including transmission losses of approximately 3%) in 2009. Average emission factors (in terms of grams per kilowatt-hour [KWh]) were derived from California Air Resources Board (CARB) statewide emission inventories of electrical and cogeneration facilities data along with the California Energy Commission's electrical generation data. As shown in Table 3-4, the Project is expected to increase statewide power plant emissions.

Table 3-4
2009 Power Plant Emission Changes due to HST

Electricity Required (GWH per day)	Change in Emissions due to HST (Tons/Year)					
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
8.24	37	376	252	33	51	47

The system will be powered by the state's electrical grid, and therefore no single generation source for the electrical power requirements can be identified. Emission changes from power generation can therefore be predicted only on a statewide level. The State of California is requiring that a greater fraction of electricity generated for the state's power portfolio come from renewable energy sources. As a result, the emissions generated to power the HST System are expected to be lower in the future compared to emission estimates used in this analysis.

3.1.4 Regional Emissions

Regional emissions include the portion of emissions from vehicle and air travel, power stations that would operate in the project study area, and the direct HST operation emissions from the stations, HMF, and train movements. As shown in Table 3-5, the regional criteria pollutant emissions from the Existing Conditions Plus Project would be less than those under Existing Conditions except PM_{10}. The amount of PM_{10} emission increase is below the SJVAPCD CEQA thresholds. Therefore, the Project demonstrates a regional benefit for all criteria pollutants analyzed compared to Existing Conditions.

Table 3-5
Summary of 2009 Regional Changes in Operational Emissions (tons/year)[e]

Activities	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Indirect Existing Conditions Plus Project Emissions						
Vehicle emissions	-58	-1,022	-668	-1.4	-29	-22
Air travel emissions	0.00	-7.3	-7.3	-0.52	0.00	0.00
Power plant emissions[a]	3.7	38	25	3.3	5.2	4.8
Direct Existing Conditions Plus Project Emissions [b]						
Train station operations	21	601	69	0.63	6.3	3.6
HMF onsite emissions	0.56	9.0	3.5	0.47	0.13	0.12
HMF offsite mobile source emissions	2.4	66	11	0.072	0.74	0.44
Overnight layover/servicing maintenance facility offsite emissions	0.059	1.7	0.18	0.0018	0.018	0.010
Fugitive dust from train operations	N/A	N/A	N/A	N/A	22	3.2
Existing Conditions Plus Project Total [c]	**-31**	**-314**	**-566**	**2.6**	**4.7**	**-9.7**
San Joaquin Valley Air Pollution Control District (SJVAPCD) CEQA	10	N/A	10	N/A	15	15

Activities	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Significance Thresholds						
Exceeds SJVAPCD CEQA Thresholds [d]	No	N/A	No	N/A	No	No

[a] The changes in power plant emissions are presented for the alternative with the longest alignment.

[b] Direct emissions were taken from the EIR / EIS and *Air Quality and Global Climate Change Technical Report*, with adjustments to on-road vehicle emissions using 2009 emission factors.

[c] The total includes the indirect and direct emissions.

[d] The SJVAPCD has significance thresholds for NO_x, Reactive Organic Gases (ROG)/VOC, PM_{10}, and $PM_{2.5}$ (SJVAPCD, 2002). The District currently does not have thresholds for CO or SO_2.

[e] All emissions presented in this table are differences between the Existing Conditions Plus Project and the Existing Conditions.

4.0 State and Regional Greenhouse Gas Impacts

Table 4-1 summarizes the statewide GHG emission changes (expressed in terms of CO_2) due to the Project. As shown in Table 4-1, the Project is predicted to have a beneficial effect on statewide GHG emissions. The analysis estimated the emission changes from reduced on-road VMT, reduced intrastate air travel, and increased electrical demand.

GHG emissions would be reduced when comparing the Existing Conditions Plus Project to Existing Conditions, due to the reductions in regional VMT and air travel after project build-out. Although operation of the HST would use indirect electricity, which would cause an increase in indirect GHG emissions, the Project would overall have lower GHG emissions compared to Existing Conditions due to the greater reduction in GHGs emitted from vehicles and aircraft compared to Existing Conditions.

Table 4-1
2009 Estimated Statewide GHG Emission Changes due to the HST

Project Element	Change in CO_2 Emissions due to HST (Metric tons/Year)
Roadways	-2,950,079
Planes	-279,126
Energy (Power Plants)	903,974
Total	**-2,325,232**
Note: Totals may not add up exactly due to rounding.	

4.1.1 On-Road Vehicles

As shown in Table 4-2, the HST is predicted to reduce statewide daily roadway VMT by over 17 million miles due to travelers choosing to use the HST rather than drive. This equates to a savings of approximately 8,900 tons of CO_2 per day compared to Existing Conditions. The on-road vehicle emissions analysis is based on projected VMT changes and associated average daily speed estimates, calculated for each affected county as part of the Project's transportation analysis. GHG emission factors were obtained from EMFAC2007, using parameters set within the program for each county to reflect travel within each county and statewide parameters to reflect travel through each county.

Table 4-2
2009 On-Road Vehicles GHG Emission Changes due to the HST

County	Existing Daily VMT	Existing Plus Project Daily VMT	Change in CO_2 Emissions with HST (Metric Tons/Year)
Fresno County	22,500,000	22,050,000	-84,096
Madera County	4,177,690	4,094,136	-15,632
Merced County	7,000,000	6,860,000	-30,543
Statewide Total	888,400,000	870,632,000	-2,950,079
Note: Totals will not add up because additional counties outside of the region area are not presented.			

4.1.2 Airport Emissions

As shown in Table 4-3, the HST is predicted to reduce the number of flights due to travelers choosing to use the HST rather than fly to their destination. EDMS was used to estimate an aircraft's GHG emission factors. EDMS estimated the emissions generated from the projected number of LTO cycles. Along with the emissions from the aircraft themselves, emissions generated from associated ground maintenance activities were also included. Average aircraft GHG emissions were calculated based on the profile of aircraft currently servicing the San Francisco to Los Angeles corridor. The number of trips removed due to the HST was estimated in the travel demand modeling analysis conducted for the Project.

Table 4-3
2009 Aircraft GHG Emission Changes (in terms of CO_2) due to the HST

Origin	No. of Flights Removed per Day	Change in CO_2 Emissions due to HST (Metric tons/Year)
Central Coast	-1	-722
Far North	-9	-11,540
Fresno/Madera	0	0
Kern	-9	-11,540
LA Basin_North	-25	-31,013
LA Basin_South	-51	-63,470
Merced	-1	-722
Monterey Bay	-9	-11,540
Sacramento Region	-9	-11,540
San Diego Region	-27	-33,897
San Joaquin	-4	-5,050
SF Bay Area	-75	-93,762
South SJ Valley	0	0
Stanislaus	-3	-3,606
W. Sierra Nevada	-1	-722

Origin	No. of Flights Removed per Day	Change in CO_2 Emissions due to HST (Metric tons/Year)
Statewide Total	-224	-279,126
Note: Totals may not add up exactly due to rounding.		

4.1.3 Power Plant Emissions

The HST is expected to increase electrical requirements compared to Existing Conditions. The electrical demands due to propulsion of the trains, operation of the trains at terminal stations, in storage depots, and in maintenance facilities etc., are conservatively estimated to be 8.24 GWH per day (including transmission losses of approximately 3%) in 2009. Average emission factors (in terms of grams per KWh) were derived from CARB statewide emission inventories of electrical and cogeneration facilities data along with the California Energy Commission's electrical generation data. As shown in Table 4-4, the project is expected to increase statewide GHG emissions.

The system will be powered by the state's electrical grid, and therefore no single generation source for the electrical power requirements can be identified. Emission changes from power generation can therefore be predicted only on a statewide level. The State of California is requiring that a greater fraction of electricity generated for the state's power portfolio come from renewable energy sources. As a result, the emissions generated to power the HST System are expected to be lower in the future compared to emission estimates used in this analysis.

Table 4-4
2009 Power Plant GHG Emission Changes (in terms of CO_2) due to the HST

Electricity Required (GWH per day)	Change in CO_2 Emissions due to HST (Metric Tons/Year)
8.24	903,974

4.1.4 HST Operations

Operation of the HST would result in GHG emissions from the combustion of fossil fuels through onsite sources and offsite mobile sources used for employee commutes and vendor trips to the maintenance facilities and HST stations. No direct GHG emissions would result from operation of the trains on the alignment because the trains would be electrically powered. Train operation would result in only indirect GHG emissions from energy consumption, as discussed in the power plant analysis. Table 4-5 summarizes the regional GHG emissions from the proposed Project, indicating a net increase in emissions compared to Existing Conditions.

Table 4-5
2009 HST Regional GHG Emissions (metric tons/year)

Activities	2009 CO_2 Operational Emissions[a]
Regional VMT	-130,272
Regional Airport (Fresno-Yosemite International)	-1,245
Indirect Regional Power	91,314
HST Station and HMF Operations	58,415

Activities	2009 CO_2 Operational Emissions[a]
Net Regional Difference	18,212
[a] Emission factors for CO_2 do not account for improvements in technology.	

5.0 Mobile Source Air Toxic Analysis

As shown in Table 3-2, the Existing Conditions Plus Project would reduce regional VMT by an average of 2% from the Existing Conditions. Since MSAT emission rates are proportional to VMT, a reduction of the regional VMT would also result in a reduction of MSAT emissions. Therefore, the Existing Conditions Plus Project would have lower MSAT emissions than the Existing Conditions and would result in a net beneficial impact.

6.0 Microscale CO Analysis

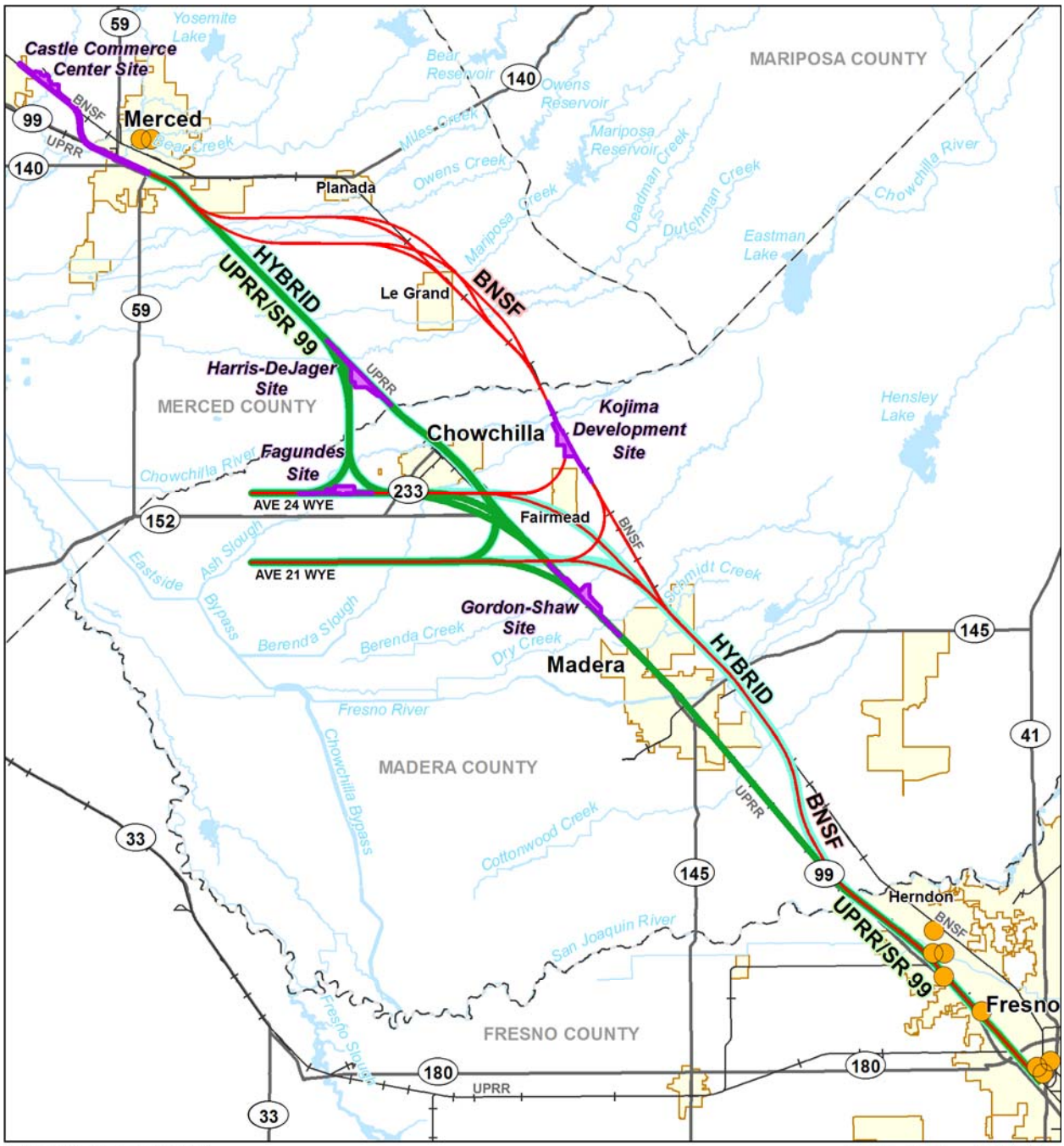
Intersections near the project area were considered to determine whether the Project would create areas of potentially elevated CO concentrations, referred to as *hot spots*. The CO analysis focused on locations near the HST stations, the HMF, and locations where a change in roadway structure or traffic conditions would occur.

The intersections evaluated for potential violations of state and local CO standards using the methodology described in Section 2.0 are shown in Figure 6-1. The methodology was used for the following areas:

- Merced Station
- Fresno Station
- Castle Commerce Center HMF
- Between Herndon Avenue and Shaw Avenue north of SR 99
- Along SR 99 realignment and widening segments

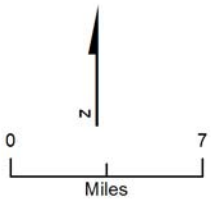
Intersections included in the CO hot spot modeling were selected based on comparisons of level of service, traffic volumes, and delay time under Existing Conditions and Existing Conditions Plus Project at the intersections. Tables 6-1, 6-2, and 6-3 summarize the modeled CO concentrations for the selected intersections. The CO hot-spot analysis results presented in the tables include the modeled concentrations plus the background concentrations. The background CO concentrations are from monitored data representing existing conditions (2007 – 2009). Modeling results for intersections near the Fresno Station were taken from *Fresno to Bakersfield Section Air Quality and Global Climate Change Technical Report* (Authority and FRA 2011c).

As shown in Tables 6-1 and 6-2, the intersections evaluated would have CO concentrations lower than the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for both the Existing Conditions and Existing Conditions Plus Project. Therefore, the localized CO emissions from the Existing Conditions Plus Project would not be expected to cause a violation of the ambient air standards, and the localized impacts at affected intersections would be less than significant.



Source: Authority and FRA (2011).

MF_EIS_AQ_04 Jun 10, 2011



UPRR/SR 99 Alternative
BNSF Alternative
Hybrid Alternative
Potential Heavy Maintenance Facility
City Limit
County Boundary
Railroad
Intersection Evaluated in CO Modeling Analysis

Figure 6-1
Intersections Evaluated for CO Hot Spot Analysis

CALIFORNIA High-Speed Rail Authority
U.S. Department of Transportation Federal Railroad Administration

Table 6-1
Maximum Modeled CO Concentrations at Intersections near the Merced HST Station and Castle Commerce Center HMF Site[a, b]

Intersection	Existing Conditions		Existing Plus Project Option A (Local Parking Option)		Existing Plus Project Option B (Remote Parking Option)	
	Max 1-Hour CO Concentration (ppm)	Max 8-Hour CO Concentration (ppm)[c]	Max 1-Hour CO Concentration (ppm)	Max 8-Hour CO Concentration (ppm)[c]	Max 1-Hour CO Concentration (ppm)	Max 8-Hour CO Concentration (ppm)[c]
Olive Ave / R St – PM	5.90	3.82	4.00	2.49	4.00	2.49
Olive Ave / M St – PM	5.90	3.82	4.00	2.49	4.00	2.49
Ambient Air Quality Standards						
CAAQS	20	9	20	9	20	9
NAAQS	35	9	35	9	35	9

Notes:
[a] Concentrations include a predicted 1-hour background concentration of 3.5 ppm and an 8-hour background concentration of 2.14 ppm, representing the second-highest measured CO concentrations in years 2007-2009.
[b] The worst-case intersection associated with the Merced Station was also identified as a worst-case intersection for the Castle Commerce Center HMF. Only the Merced Station contributes to the modeled impacts, so additional modeling was not done for the Castle Commerce Center HMF.
[c] A persistence factor of 0.7 was used to estimate the 8-hour CO concentrations based on the generalized persistence factor for urban locations in the CO Protocol (Caltrans, 1997).
Acronyms:
CO = carbon monoxide
ppm = parts per million

Table 6-2
Maximum Modeled CO Concentrations at Intersections near the Fresno HST Station[a] and Herndon Ave and Shaw Ave[b]

Intersection	Existing Conditions		Existing Plus Project Option	
	Max 1-Hour CO	Max 8-Hour CO	Max 1-Hour CO	Max 8-Hour CO
	Concentration (ppm)	Concentration (ppm)[c]	Concentration (ppm)	Concentration (ppm)[c]
Fresno Train Station Area				
Van Ness Street/ Inyo Street	3.6	2.7	3.6	2.7
S Street/ Tulare Street	3.6	2.7	3.7	2.8
Van Ness Avenue/ Fresno Street	3.8	2.8	3.8	2.8
Herndon Ave and Shaw Ave				
Blythe Ave & Shaw Ave - AM	6	3.89	4	2.49
Brawley Ave & Shaw Ave - PM	6.1	3.96	4	2.49
Figarden Dr & Bullard Ave - AM	3.5	2.14	3.5	2.14
Figarden Dr & Bullard Ave - PM	3.5	2.14	3.5	2.14
Ambient Air Quality Standards				
CAAQS	20	9	20	9
NAAQS	35	9	35	9

Notes:
[a] Background CO data taken from Fresno First Street monitoring station were found to be 3.10 ppm for 1-hour CO concentration and 2.34 ppm for 8-hour CO concentration.
[b] Concentrations include a predicted 1-hour background concentration of 3.5 ppm and an 8-hour background concentration of 2.14 ppm, representing the second-highest measured CO concentrations in years 2007-2009.
[c] A persistence factor of 0.7 was used to estimate the 8-hour CO concentrations based on the generalized persistence factor for urban locations in the CO Protocol (Caltrans, 1997).
Acronyms:
CO = carbon monoxide
ppm = parts per million

Table 6-3
Maximum Modeled CO Concentrations at Intersections along SR-99 [a]

Intersection	Existing Conditions		Existing Plus Project		Existing Plus Mitigated Project	
	Max 1-Hour CO Concentration (ppm)	Max 8-Hour CO Concentration (ppm)[b]	Max 1-Hour CO Concentration (ppm)	Max 8-Hour CO Concentration (ppm)[b]	Max 1-Hour CO Concentration (ppm)	Max 8-Hour CO Concentration (ppm)[b]
SR-99						
Clinton Ave / Weber Ave - PM	6.5	4.24	4.1	2.56	4	2.49
Ashlan & Brawley/SR-99 NB Ramp – PM	6.8	4.45	4.1	2.56	NA	NA
Ambient Air Quality Standards						
CAAQS	20	9	20	9	20	9
NAAQS	35	9	35	9	35	9

Notes:
[a] Concentrations include a predicted 1-hour background concentration of 3.5 ppm and an 8-hour background concentration of 2.14 ppm, representing the second-highest measured CO concentrations in years 2007-2009.
[b] A persistence factor of 0.7 was used to estimate the 8-hour CO concentrations based on the generalized persistence factor for urban locations in the CO Protocol (Caltrans, 1997).
Acronyms:
CO = carbon monoxide
ppm = parts per million

7.0 Emission Reduction Measures

As discussed above, the HST Project would have net beneficial effects to air quality compared to Existing Conditions because of the reduction in regional emissions. No additional adverse impacts would be expected from the HST Project compared to what is described in the EIR/EIS. The proposed emission reduction measures are still valid and no additional emission mitigation measures are required.

8.0 References

California Air Resources Board (CARB). 2007. *EMFAC2007 Release*. http://www.arb.ca.gov/msei/onroad/latest_version.htm. Accessed February, 2011.

California Department of Transportation (Caltrans). 1997. *Transportation Project-Level Carbon Monoxide Protocol*. Prepared by University of California, Davis. Sacramento, CA. Revised December 1997.

California High-Speed Rail Authority and Federal Railroad Administration (Authority and FRA). 2011a. *Merced to Fresno Section Air Quality and Global Climate Change Technical Report*.

Authority and FRA. 2011b. *Merced to Fresno High Speed Train Environmental Impact Report and Environmental Impact Statement (EIR/EIS)*.

Authority and FRA. 2011c. *Fresno to Bakersfield Section Air Quality and Global Climate Change Technical Report*.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2002. *Guide for Assessing and Mitigating Air Quality Impacts.* Adopted August 20, 1998. Fresno, CA. Revised January 10, 2002.

E.2-1 Summary of Operation-Related GHG Emissions

This tab presents the operational GHG emissions from all High Speed Train components.

Operational Year 2009

Operational Emissions

High Speed Train Component	CO_2 Emissions (tpy)	CO_2 Emissions (metric tons/year)
Merced Train Station	39,012	35,391
Fresno Train Station	25,020	22,698
Overnight Layover / Servicing Facility	179	163
Train Dust Wake	-	-
2009 Heavy Maintenance Facility CO_2	179	163
2009 Total CO_2 Without VMT	**64,391**	**58,415**
2009 Total CO_2e Without VMT[1]	**67,610**	**61,336**
Net Difference in Regional VMT:	-143,598	-130,272
Net Difference in Regional Power Demand:	100,655	91,314
Net Difference in Regional Flight Demand:	-1,372	-1,245

Notes:

1. According to the EPA (http://www.epa.gov/oms/climate/420f05004.htm), emissions of CH_4 and N_2O from passenger vehicles are much lower than emissions of CO_2, contributing in the range of 5-6 percent of the CO_2-equivalent emissions. In addition, the URBEMIS2007 model does not estimate CH_4 and N_2O emissions. Therefore, to account for the CH_4 and N_2O emissions, the CO_2 emissions were conservatively increased by 5 percent to calculate the CO_2-equivalent emissions. Assumed that this approach for passenger vehicles was applicable to all emissions sources.

E.2-2 Summary of Operational Emissions

This tab presents the operational emissions from all High Speed Train components.

Operation Emissions

High Speed Train Component	Emissions (tpy)						
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
Operational Year 2009							
Merced Train Station [1]	13	366	42	0.39	3.8	2.2	39,012
Fresno Train Station [2]	8.1	234	27	0.25	2.4	1.4	25,020
Overnight Layover / Servicing Facility	0.059	1.7	0.18	0.0018	0.018	0.010	179
Train Wake Dust	-	-	-	-	21.6	3.2	-
Heavy Maintenance Facility	2.9	75	14	0.55	0.87	0.56	25,800
2009 Total Without VMT	**24**	**677**	**84**	**1.2**	**29**	**7.4**	**90,012**
Net Difference in Regional VMT:	-58	-1,022	-668	-1.4	-29	-22	-143,598
Net Difference in Regional Power Demand:	3.7	38	25	3.3	5.2	4.8	100,655
Net Difference in Regional Flight Demand:	0.00	-7.3	-7.3	-0.52	0.00	0.00	-1,372

Notes:

1. Emissions do not include CO emissions from traffic congestion in the parking structures.
2. Fresno Train Station operation emissions were calculated by URS as part of the analysis for the Fresno - Bakersfield segment.

E.2-3 Merced Train Station: Operational Emissions

This tab estimates operational emissions from employee and visitor commutes to the Merced Train Station. The operation of area sources and electricity consumption required for operating the Merced Train Station are also considered.

Operational VMT Emissions

Emission Source [1]	Number of Round Trips per Day	Round Trip Distance (miles)	Emissions (tpy)							
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Operational Year 2009										
Employees [2, 3]	32	40	0.059	1.732	0.181	0.002	0.018	0.010	179	0.016
Visitors by Shuttle / Bus [3, 4]	20	40	0.273	2.137	4.219	0.007	0.065	0.055	669	0.016
Visitors by Car	6,688	40	12.243	362.078	37.806	0.377	3.740	2.180	37,500	3.310
2009 Total	**--**	**--**	**12.575**	**365.948**	**42.206**	**0.385**	**3.823**	**2.245**	**38,348**	**3.342**

Notes:
1. 304 visitors would arrive at the station via biking or walking which would not generate air emissions.
2. Assumed percentage of employees that carpool: 20%
3. Assumed the number of employees and visitors for 2035 operation remains the same should operation begin in 2009.
4. 608 visitors travel by bus, but each bus is expected to hold 30 people (Lightbody, James/AECOM. Personal communication with Andrea White/CH2M HILL. July 22, 2010).

Vehicle Emission Factors

Vehicle Type	Vehicle Emission Factor (g/mile) [1]							
	ROG	CO	NOx	SOx	PM_{10} [2]	$PM_{2.5}$ [2]	CO_2	CH_4
Operational Year 2009								
Passenger	0.114	3.364	0.351	0.004	0.035	0.020	348.405	0.031
Shuttle / Bus [3]	0.838	6.553	12.934	0.020	0.199	0.170	2,049.902	0.050

Notes:
1. Emission factors are from EMFAC2007 (Version 2.3) for passenger vehicles (50% LDA-All and 50% of the average of LDT1-All and LDT2-All) and urban buses (UBUS-All) traveling at 35 mph.
2. Emission factors for PM_{10} and $PM_{2.5}$ include contributions from exhaust, brake-wear, and tire-wear.

3. The bus emission factors were determined using all model years prior to 2009. This is a conservative estimate because the usable life span for city buses is usually 12 years (FTA, *Useful Life of Transit Buses and Vans* , April 2007).

Operational Area Source Emissions

Emission Source	Emissions (tpy) [1]						
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
Operational Year 2009							
Natural Gas Usage	0.010	0.120	0.150	0.000	0.000	0.000	176
Landscaping	0.010	0.140	0.000	0.000	0.000	0.000	0
2009 Total	**0.020**	**0.260**	**0.150**	**0.000**	**0.000**	**0.000**	**177**

Notes:
1. Emissions calculated in URBEMIS2007 using the General Light Industry land use category.

Operational Indirect Emissions

Emission Source	Building Size (sqft)	Electricity Usage Rate (kWh/sqft/year) [1]	Emissions (tpy)		
			CO_2	CH_4	N_2O
Operational Year 2009					
Station Buildings	105,600	13.55	487	0.020	0.004
2009 Total	**--**	**--**	**487**	**0.020**	**0.004**

Notes:
1. Electricity Usage Rate from Table A9-11-A (CEQA Handbook, 1993). The Station Buildings are considered 'Retail'.

Electricity Emission Factors

	Emission Factor (lb/MWh) [1, 2]		
	CO_2	CH_4	N_2O
Purchased Electricity	681.01	0.0283	0.00623

Notes:
1. Emission factors from U.S. EPA eGRID2010 Version 1.0 (2007 data) for the WECC California subregion.
2. Emission factors are not available for future years. As a result, the available emission factors were applied to 2009 operations.

E.2-4 Heavy Maintenance Facility: Onsite Operational Emissions

This tab estimates onsite emissions from operation of switch locomotives, diesel equipment, and diesel trucks within the Heavy Maintenance Facility rail yard. It was assumed that, as applicable, vehicle emission factors for 2017 held true for 2009 operations.

Switch Locomotive Horsepower and Load Factors [1]

Notch	Horsepower	Percent Horsepower in Use	Percent Time in Notch	Actual Percent Time in Use	Engine Horsepower	Equivalent Horsepower Used in Analysis	Load Factors
Idle	13	0.3%	38.0%	100.0%	7	7	0.3%
Dynamic Brake	128	3.4%	12.5%	20.2%	68	14	--
1	211	5.6%	6.5%	10.5%	112	12	--
2	457	12.1%	6.5%	10.5%	242	25	--
3	928	24.6%	5.2%	8.4%	492	41	--
4	1,084	28.7%	4.4%	7.1%	575	41	--
5	1,666	44.2%	3.8%	6.1%	883	54	--
6	2,375	62.9%	3.9%	6.3%	1,259	79	--
7	3,182	84.3%	3.0%	4.8%	1,687	82	--
8	3,773	100.0%	16.2%	26.1%	2,000	523	--
Total for Moving Locomotives	--	--	100%	100%	--	877	44%

Notes:

1. Data was prepared by Parsons Brinckerhoff in July 2011 and was provided in a spreadsheet called "CA HMF All EmissionsR.xls".

Onsite Operational Emission Factors

HMF Operations	Mode	Average Number of Equipment	Engine Horespower	Load Factor (%) [1]	Emission Factors (g/bhp-hr)						
					ROG	CO	NOx	SOx [2, 3]	PM_{10}	$PM_{2.5}$	CO_2 [4]
Locomotive [5, 6, 7]	Idle	2	2,000	0.3%	0.08	1.83	1.3	0.006	0.03	0.03	672
	Moving	2	2,000	44.0%	0.08	1.83	1.3	0.006	0.03	0.03	672
Diesel Equipment [5, 6, 8, 9]	--	6	200	60.0%	0.14	2.6	0.3	0.2	0.015	0.015	1,756
Diesel Trucks [10, 11]	--	20	--	--	1.45	3.56	11.03	0.01	0.596	0.514	1,437

Notes:

1. Load factors for locomotives are weighted-average factors that were estimated for idling and moving modes based on in-use power at each notch setting (see Table AQ-1).
2. SOx emission factors for locomotives are based on the carbon content and fuel density.
3. SOx emission factor was obtained from "Technical Information and References", Table 2, Santa Barbara County Air Pollution Control District "Construction Equipment Controlled Emission Factors" (such as loaders, graders, dozers, etc.). These emission factors reflect usage of low (0.05%) sulfur content in the fuel (http://www.sbcapcd.org/eng/tech/apcd-24.htm).
4. CO_2 emission factors for locomotives are based on the carbon content and fuel density.
5. Number of trains operated in the yard (2), duration of operation in each mode, and number of pieces of diesel equipment (6) were provided by the project engineers. It is assumed that each locomotive will be continously moving and/or idling for 2 hours over each 24-hour period.
6. The horsepower of the switching train locomotive is assumed to be 2,000 hp; the horsepower of the diesel equipment was assumed to be 200 hp.
7. The locomotives will be purchased after 2015 and, therefore, will be subject to Tier 4 emission standards. PM Emission factors are the most stringent Tier 4 federal standards for switch locomotives that were introduced in May 2008 (73 FR 88 25098-25352, May 6, 2008) and are also povided in Table 4, Switch Locomotive Tier 4 Emission Standards from an online source (http://dieselnet.com/standards/us/).
8. Equipment emission factors are Tier 4 federal standards for on-road (off-road) diesel engines that were introduced in May 2004 (69 FR 38957-39273, 29 June, 2004) and are also provided in Table 3, Tier 4 Emission Standards for engines up to 560 kw from an online source (http://dieselnet.com/standards/us/).
9. Each piece of equipment was assumed to operate for 8 hours over each 24-hour period; the load factor for equipment was assumied to be 0.6.
10. PM emission factors are for the year 2017 for HDD vehicles from the EMFAC2007 model and are the sum of the running, tire wear, and break wear emissions and expressed in grams per mile. NOx, ROG, and CO emission factors are for the year 2017 for HDD vehicles from the EMFAC2007 model.
11. Number of delivery trucks and delivery truck operations were assumed to be 20 trucks per hour that will operate 8 hours over each 24-hour period.

Onsite Operational Emissions

HMF Operations	Mode	Emissions (lbs/year)							Emissions (tpy) [2]						
		ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$ [1]	CO_2	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
Locomotive	Idle	1.77	40.6	28.8	0.137	0.665	0.645	12,970	0.0009	0.0203	0.0144	0.0001	0.0003	0.0003	6.48
	Moving	226	5,170	3,670	17.5	84.7	82.2	3,094,354	0.113	2.59	1.84	0.0088	0.0424	0.0411	1,547
Diesel Equipment	--	649	12,100	1,390	927	69.5	67.4	8,133,277	0.325	6.05	0.695	0.464	0.0348	0.0337	4,067
Diesel Trucks	--	253	621	1,920	1.74	104	89.6	25,885,746	0.127	0.311	0.960	0.0009	0.0520	0.0448	12,943
Total	--	**1,130**	**17,932**	**7,009**	**946**	**259**	**240**	**37,126,346**	**0.565**	**8.97**	**3.50**	**0.473**	**0.129**	**0.120**	**18,563**

Notes:

1. Based on information provided by J. Soden, Parsons Brinckerhoff assumed that $PM_{2.5}$ emissions were 92 percent of the PM_{10} emissions for the locomotives and diesel equipment. This is captured in the emissions estimates and not in the emission factors provided.
2. Emissions (lbs/year) were converted to Emissions (tpy) using the following conversion: 2,000 lbs/ton

Operational emissions from electricity consumption were considered negligible for the Heavy Maintenance Facility and were, therefore, not estimated.

E.2-5 Heavy Maintenance Facility: Offsite Operational Emissions

This tab estimates operational emissions from employee commutes and deliveries to the Heavy Maintenance Facility.

Offsite Operational VMT Emissions

Emission Source [1]	Number of Round Trips per Day	Round Trip Distance (miles)	Emissions (tpy)							
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Operational Year 2009										
Employees [2, 3]	1,200	40	2.197	64.966	6.783	0.068	0.671	0.391	6,728	0.594
Deliveries	20	120	0.163	0.674	4.082	0.005	0.065	0.045	509	0.007
2009 Total	**--**	**--**	**2.359**	**65.640**	**10.865**	**0.072**	**0.736**	**0.436**	**7,237**	**0.601**

Notes:

1. Onsite diesel-fueled vehicle emissions were included with the stationary source combustion calculations.
2. Assumed percentage of employees that carpool: 20%
3. Assumed the number of employees for 2035 operation remains the same should operation begin in 2009.

Vehicle Emission Factors

Vehicle Type	Vehicle Emission Factor (g/mile)							
	ROG	CO	NOx	SOx	PM_{10} [2]	$PM_{2.5}$ [2]	CO_2	CH_4
Operational Year 2009								
Passenger [1]	0.114	3.364	0.351	0.004	0.035	0.020	348.405	0.031
Delivery Truck [1]	0.169	0.698	4.227	0.005	0.068	0.047	526.835	0.008

Notes:

1. Emission factors are from EMFAC2007 (Version 2.3) for passenger vehicles (50% LDA-All and 50% of the average of LDT1-All and LDT2-All) and delivery trucks (average of LHD1-DSL and LHD2-DSL) traveling at 35 mph.
2. Emission factors for PM_{10} and $PM_{2.5}$ include contributions from exhaust, brake-wear, and tire-wear.

E.2-6 Overnight Layover / Servicing Facility: Operational Emissions

This tab estimates operational emissions from employee commutes to the Overnight Layover / Servicing Facility.

Operational VMT Emissions

Emission Source	Number of Round Trips per Day	Round Trip Distance (miles)	Emissions (tpy)							
			ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Operational Year 2009										
Employees [1, 2]	32	40	0.059	1.732	0.181	0.002	0.018	0.010	179	0.016
2009 Total	**--**	**--**	**0.059**	**1.732**	**0.181**	**0.002**	**0.018**	**0.010**	**179**	**0.016**

Notes:

1. Assumed percentage of employees that carpool: 20%
2. Assumed the number of employees for 2035 operation remains the same should operation begin in 2009.

Vehicle Emission Factors

Vehicle Type	Vehicle Emission Factor (g/mile) [1]							
	ROG	CO	NOx	SOx	PM_{10} [2]	$PM_{2.5}$ [2]	CO_2	CH_4
Operational Year 2009								
Passenger	0.114	3.364	0.351	0.004	0.035	0.020	348.405	0.031

Notes:

1. Emission factors are from EMFAC2007 (Version 2.3) for passenger vehicles (50% LDA-All and 50% of the average of LDT1-All and LDT2-All) traveling at 35 mph.
2. Emission factors for PM_{10} and $PM_{2.5}$ include contributions from exhaust, brake-wear, and tire-wear.

Operational emissions from electricity consumption were considered negligible for the Overnight Layover / Servicing Facility and were, therefore, not estimated. There are no stationary sources associated with the Overnight Layover / Servicing Facility. As a result, stationary source emissions were not estimated.

E.2-7 Train Dust Wake: Fugitive Dust Emissions

This tab estimates fugitive dust emissoins resulting from operation of the HST and maintenance trips along the length of the alignment.

Train Velocity	97.0 m/s	217 mph
	98.3 m/s	220 mph

$P = 58(u^* - ut^*)^2 + 25(u^* - ut^*)$

$P = 0$ for $u^* < ut^*$

$ut^* =$ 0.19 m/s

u* = Friction Velocity for the Fastest Mile (m/s)

ut* = Threshold friction velocity (m/s), 0.5 m/s (lowest number from AP42, for coal pile)

0.19 m/s based on the lowest value for disturbed desert soil

Wind speed Profile

$$u = (1.2319)^{0.072v-4} \times (0.4575\,d^2 - 3.5496\,d + 9.1545)$$

Where:

u: the maximum wind velocity around human body near the train (m/s).

d: human-train distance (m).

v: train running speed (m/s).

EF (per event) = k x P

k is a particle size multiplier

k = 0.5 for particles < 10 um

k = 0.075 for particles < 2.5 um

$u(z) = (u^*/0.4)\ln(z/zo)$

z = 288 cm

z0 = 0.01 cm

u(z) = wind speed at a certain height above the surface (cm/s)

u* = friction velocity for fastest mile. Based on disturbed desert soils (DRI Study)

z = height above the surface (288 cm), based on 1/2 of the train height (1.88 m) & embankment height (1m)

zo = surface roughness height (cm), assume 0.01 cm for the at grade right of way

0.4 is von Karman's constant, dimensionless

Train-Object Distance	Wind Speed from 217 mph Train	Wind Speed from 220 mph Train	Friction Velocity	Erosion Potential	Emission Factor	
(m)	u (m/s)		u* (m/s)	P (g/m^2)	PM_{10} (g/m^2)	$PM_{2.5}$ (g/m^2)
1	11.30	11.53	0.45	10.37	5.18	0.78
1.1	10.81	11.03	0.43	9.33	4.67	0.70
1.2	10.35	10.56	0.41	8.38	4.19	0.63
1.3	9.90	10.10	0.39	7.49	3.75	0.56
1.4	9.47	9.66	0.38	6.68	3.34	0.50
1.5	9.06	9.24	0.36	5.92	2.96	0.44
1.6	8.66	8.83	0.34	5.23	2.62	0.39
1.7	8.28	8.45	0.33	4.60	2.30	0.34
1.8	7.92	8.08	0.31	4.02	2.01	0.30
1.9	7.57	7.72	0.30	3.48	1.74	0.26
2	7.24	7.39	0.29	3.00	1.50	0.22
2.1	6.93	7.07	0.28	2.56	1.28	0.19
2.2	6.63	6.77	0.26	2.16	1.08	0.16
2.3	6.36	6.48	0.25	1.79	0.90	0.13
2.4	6.09	6.22	0.24	1.46	0.73	0.11
2.5	5.85	5.97	0.23	1.17	0.58	0.09
2.6	5.62	5.74	0.22	0.90	0.45	0.07
2.7	5.41	5.53	0.22	0.67	0.33	0.05
2.8	5.22	5.33	0.21	0.46	0.23	0.03
2.9	5.05	5.15	0.20	0.27	0.14	0.02
3	4.89	4.99	0.19	0.11	0.05	0.01
3.07	4.79	4.88	0.19	0.01	0.00	0.00

PM_{10} Emissions	$PM_{2.5}$ Emissions	Emissions Units
3.74	0.56	grams/meter traveled
6023.03	903.45	grams/VMT (one side)
26.53	3.98	lb/miles (both sides)
21.613	3.242	Tpy (24 disturbances)

Note:

Annual emissions determined by scaling emissions by 67.88 miles (the length of the at-grade rail for the BNSF Ave 24 Alternative). This Alternative had the longest possible at-grade length.

Fugitive dust emissions are only expected as a result of train movement along the at-grade track since the dust would be kicked up from the surrounding embankment.

E.2-8 Regional and Statewide Emissions: Vehicle Miles Traveled

This tab estimates operational emissions from regional and statewide vehicle miles traveled; the values reflect the difference in vehicle miles traveled as a result of building the High Speed Train.

County	Existing VMT	Existing Plus Project VMT	Change in Annual Emissions Due to HST (tons/day) [1]							Change in Annual Emissions Due to HST (tpy) [2]						
			ROG	CO	NOx	SOx [3, 4]	PM_{10}	$PM_{2.5}$	CO_2	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
Fresno County	22,500,000	22,050,000	-0.10	-1.78	-1.07	-0.002	-0.05	-0.03	-254	-37	-650	-391	-0.9	-18	-11	-92,699
Madera County	4,177,690	4,094,136	-0.02	-0.39	-0.22	-0.0005	-0.01	-0.01	-47	-7	-142	-80	-0.2	-4	-4	-17,232
Merced County	7,000,000	6,860,000	-0.04	-0.63	-0.54	-0.001	-0.02	-0.02	-92	-15	-230	-197	-0.3	-7	-7	-33,668
Regional Total	**33,677,690**	**33,004,136**	**-0.16**	**-2.80**	**-1.83**	**-0.004**	**-0.08**	**-0.06**	**-393**	**-58**	**-1,022**	**-668**	**-1**	**-29**	**-22**	**-143,598**
Statewide Total	**888,400,000**	**870,632,000**	**-3.56**	**-69.67**	**-24.31**	**-0.08**	**-1.21**	**-0.90**	**-8,909**	**-1,299**	**-25,430**	**-8,873**	**-29**	**-442**	**-329**	**-3,251,873**

Notes:

1. Change in Annual Emissions Due to HST, as well as the VMT data, were provided from the PMT as documented in the Existing Conditions Memorandum.
2. Assumed 365 days of regional and statewide traffic to compute the annual emissions from the daily emissions.
3. To estimate the SO_2 Change in Annual Emissions Due to HST, used an Emission Burden Factor provided by the PMT as follows:

Fresno County	0.005	g/mile
Madera County	0.005	g/mile
Merced County	0.006	g/mile

4. Converted emissions in g to tons using the following conversion factor: 907,185

E.2-9 Regional and Statewide Emissions: Power and Flight Demands

This tab estimates operational emissions from regional and statewide power and flight demands; the values reflect the difference in power and flight demands as a result of building the High Speed Train.

Electricity and Flight Demands [1]

Electricity Required (GWh/day)	Total HSR (miles)	Change in Emissions due to HST (tons/day)						
		HC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2
8.24	830	0.1	1.03	0.69	0.09	0.14	0.13	2,730
Flight Origins	**No. of Flights Removed**	**Change in Emission Burdens due to HST (tons/day)**						
		HC	CO	NOx	SO_2 [2]	PM_{10}	$PM_{2.5}$	CO_2
Fresno/Madera	0	0.0	0.0	0.0	N/A	0.0	0.0	0
Merced	-1	0.0	-0.02	-0.02	N/A	0.0	0.0	-4
Total	-1	0.0	-0.02	-0.02	-0.001	0.0	0.0	-4

Notes:

1. Data taken from the Project Management Team's Air Quality Technical Report.
2. SO_2 emissions resulting from changes in flights were only provided as a total of all counties; to get the changes per 1 flight, divided the total value by 224 flights.

Regional Emissions

Alternative	Length (miles) [1]	Change in Emissions due to HST (tons/day)							Change in Emissions due to HST (tpy) [2]						
		HC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	HC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Electricity Emissions															
BNSF Ave 21	81.70	0.01	0.10	0.07	0.01	0.01	0.01	268.71	3.6	37.0	24.8	3.2	5.0	4.7	98,080
BNSF Ave 24	83.84	0.01	0.10	0.07	0.01	0.01	0.01	275.77	3.7	38.0	25.4	3.3	5.2	4.8	100,655
UPRR Ave 21	72.32	0.01	0.09	0.06	0.01	0.01	0.01	237.86	3.2	32.8	21.9	2.9	4.5	4.1	86,818
UPRR Ave 24	74.36	0.01	0.09	0.06	0.01	0.01	0.01	244.59	3.3	33.7	22.6	2.9	4.6	4.3	89,276
Hybrid Ave 24	64.08	0.01	0.08	0.05	0.01	0.01	0.01	210.77	2.8	29.0	19.4	2.5	3.9	3.7	76,932
Hybrid Ave 21	72.76	0.01	0.09	0.06	0.01	0.01	0.01	239.31	3.2	33.0	22.1	2.9	4.5	4.2	87,349
Flights Emissions															
All Alternatives	--	0.0	0.0	0.0	0.0	0.0	0.0	-4	0.0	-7.3	-7.3	-0.52	0.0	0.0	-1,372

Notes:

1. Data taken from AQ_lengths of alternatives_20110602.xlsx as provided by L. Black to K. Skadberg (6/2/11).
2. Days per year: 365

Statewide Emissions

Electricity Emissions

Electricity Required (GWh/day)	Total HSR (miles)	Change in Emissions due to HST (tons/day)							Change in Emission Burdens due to HST (Tons/Year) [1]						
		HC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	HC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2
8.24	830	0.1	1.03	0.69	0.09	0.14	0.13	2,730	36.50	375.95	251.85	32.85	51.10	47.45	996,450

Flights Emissions

Origin	No. of Flights Removed	Change in Emission Burdens due to HST (Tons/Day)							Change in Emission Burdens due to HST (Tons/Year) [1]						
		HC	CO	NOx	SO_2 [2]	PM_{10}	$PM_{2.5}$	CO_2	HC	CO	NOx	SO_2 [2]	PM_{10}	$PM_{2.5}$	CO_2
Central Coast	-1	0.00	-0.01	-0.01	0.00	0.00	0.00	-2.18	0.00	-3.65	-3.65	-0.52	0.00	0.00	-796
Far North	-9	-0.02	-0.14	-0.19	-0.01	0.00	0.00	-34.85	-7.30	-51.10	-69.35	-4.69	0.00	0.00	-12,720
Fresno/Madera	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Kern	-9	-0.02	-0.14	-0.19	-0.01	0.00	0.00	-34.85	-7.30	-51.10	-69.35	-4.69	0.00	0.00	-12,720
LA Basin_North	-25	-0.04	-0.38	-0.51	-0.04	0.00	0.00	-93.66	-14.60	-138.70	-186.15	-13.04	0.00	0.00	-34,186
LA Basin_South	-51	-0.09	-0.78	-1.04	-0.07	-0.01	-0.01	-191.68	-32.85	-284.70	-379.60	-26.59	-3.65	-3.65	-69,963
Merced	-1	0.00	-0.01	-0.01	0.00	0.00	0.00	-2.18	0.00	-3.65	-3.65	-0.52	0.00	0.00	-796
Monterey Bay	-9	-0.02	-0.14	-0.19	-0.01	0.00	0.00	-34.85	-7.30	-51.10	-69.35	-4.69	0.00	0.00	-12,720
Sacramento Region	-9	-0.02	-0.14	-0.19	-0.01	0.00	0.00	-34.85	-7.30	-51.10	-69.35	-4.69	0.00	0.00	-12,720
San Diego Region	-27	-0.05	-0.42	-0.56	-0.04	0.00	0.00	-102.37	-18.25	-153.30	-204.40	-14.08	0.00	0.00	-37,365
San Joaquin	-4	-0.01	-0.06	-0.08	-0.01	0.00	0.00	-15.25	-3.65	-21.90	-29.20	-2.09	0.00	0.00	-5,566
SF Bay Area	-75	-0.13	-1.15	-1.54	-0.11	-0.01	-0.01	-283.16	-47.45	-419.75	-562.10	-39.11	-3.65	-3.65	-103,353
South SJ Valley	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Stanislaus	-3	0.00	-0.04	-0.06	0.00	0.00	0.00	-10.89	0.00	-14.60	-21.90	-1.56	0.00	0.00	-3,975
W. Sierra Nevada	-1	0.00	-0.01	-0.01	0.00	0.00	0.00	-2.18	0.00	-3.65	-3.65	-0.52	0.00	0.00	-796
Statewide Total	**-224**	**-0.37**	**-3.42**	**-4.58**	**-0.32**	**-0.04**	**-0.04**	**-842.96**	**-135**	**-1,248**	**-1,672**	**-117**	**-15**	**-15**	**-307,680**

Notes:

1. Assumed 365 days of statewide electricity usage and flights to compute the annual emissions from the daily emissions.
2. SO_2 emissions resulting from changes in flights were only provided as a total of all counties; to get the changes per 1 flight, divided the total value by 224 flights.

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\epieper\Application Data\Urbemis\Version9a\Projects\Merced Station - Operation 2009.urb924

Project Name: Merced Station - Operation 2009

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.02	0.15	0.26	0.00	0.00	0.00	176.63
TOTALS (tons/year, mitigated)	0.02	0.12	0.22	0.00	0.00	0.00	141.30
Percent Reduction	0.00	20.00	15.38	NaN	NaN	NaN	20.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.02	0.15	0.26	0.00	0.00	0.00	176.63

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.15	0.12	0.00	0.00	0.00	176.38
Hearth							
Landscape	0.01	0.00	0.14	0.00	0.00	0.00	0.25
Consumer Products							
Architectural Coatings							
TOTALS (tons/year, unmitigated)	0.02	0.15	0.26	0.00	0.00	0.00	176.63

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.12	0.10	0.00	0.00	0.00	141.10
Hearth							
Landscape	0.01	0.00	0.12	0.00	0.00	0.00	0.20
Consumer Products							
Architectural Coatings							
TOTALS (tons/year, mitigated)	0.02	0.12	0.22	0.00	0.00	0.00	141.30

Area Source Changes to Defaults

E.4 Emission Factors for Offsite Vehicles for 2009 Operational Emissions

Title : SJVAB Annual
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/08/04 13:29:42
Scen Year: 2009 -- All model years in the range 1965 to 2009 selected
Season : Annual
Area : San Joaquin Valley Unified APCD
****
Year: 2009 -- Model Years 1965 to 2009 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006
District Average District Average San Joaquin Valley Unified APCD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	18.681	0.338	0.463	0.488	19.096	0.402	0.215	0.748	18.615	0.477	0.387	0.622	24.491	0.569	0.206	0.759	19.238	1.292	0.425	1.142	18.932	1.492	0.611	1.113	28.657	4.49	0.764	1.482	100.033	15.89	12.305	12.367	28.657	3.914	0.708	2.358	34.493	11.192	2.117	4.709	5.689	3.804	0	5.089	28.522	9.68	0.976	2.67	28.502	2.549	0.306	3.43	13.795	0.501	9.252	2.052
35	4.741	0.051	0.151	0.09	4.848	0.068	0.07	0.16	4.725	0.078	0.126	0.115	6.239	0.089	0.067	0.138	2.755	0.18	0.138	0.182	2.711	0.206	0.199	0.216	4.143	0.622	0.249	0.33	14.669	2.273	0.94	0.959	4.144	0.523	0.231	0.39	5.004	1.614	0.521	0.838	2.679	1.396	0	2.27	4.124	1.366	0.318	0.531	4.121	0.345	0.1	0.483	3.925	0.08	0.746	0.241
45	4.33	0.042	0.124	0.077	4.428	0.056	0.057	0.14	4.315	0.064	0.103	0.098	5.7	0.073	0.055	0.118	2.005	0.13	0.113	0.135	1.972	0.148	0.163	0.166	3.026	0.448	0.204	0.26	10.776	1.655	0.757	0.769	3.026	0.372	0.189	0.291	3.66	1.179	0.433	0.649	3.026	1.53	0	2.55	3.012	0.99	0.261	0.411	3.01	0.247	0.082	0.35	3.81	0.066	0.601	0.205
65	6.294	0.054	0.108	0.105	6.436	0.071	0.05	0.192	6.272	0.08	0.091	0.129	8.272	0.093	0.048	0.159	1.779	0.115	0.099	0.119	1.75	0.131	0.143	0.146	2.69	0.396	0.179	0.228	9.604	1.47	1.248	1.252	2.69	0.327	0.166	0.256	3.255	1.048	0.453	0.627	6.723	3.436	0	5.677	2.677	0.877	0.229	0.362	2.675	0.218	0.072	0.31	6.49	0.086	0.959	0.317

Pollutant Name: Carbon Monoxide Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	158.741	4.408	2.853	5.662	158.934	6.443	2.226	9.096	154.824	6.496	2.76	7.675	284.806	6.375	2.168	8.581	346.506	12.759	3.034	11.752	343.4	15.3	3.532	10.759	517.221	49.41	9.37	18.851	2532.224	185.56	19.672	22.14	517.228	47.251	8.781	29.712	576.606	84.518	12.649	35.218	41.92	18.259	0	34.388	515.852	98.736	12.251	33.496	515.642	54.496	3.946	68.783	130.022	6.345	16.145	9.706
35	51.725	2.43	0.607	2.828	51.787	3.254	0.474	4.008	50.448	3.423	0.587	3.792	92.802	3.339	0.461	4.042	68.573	2.525	0.645	2.338	67.958	3.028	0.751	2.157	102.357	9.778	1.993	3.85	501.124	36.722	4.949	5.425	102.359	9.351	1.868	5.949	114.11	16.726	1.934	6.553	27.726	11.78	0	22.65	102.087	19.54	2.605	6.782	102.045	10.785	0.839	13.62	45.832	3.039	3.994	3.825
45	53.847	2.117	0.521	2.535	53.913	2.886	0.407	3.706	52.519	3.002	0.504	3.392	96.611	2.946	0.396	3.684	62.048	2.285	0.554	2.107	61.491	2.74	0.645	1.934	92.617	8.848	1.712	3.405	453.436	33.228	3.762	4.201	92.618	8.461	1.604	5.337	103.251	15.134	1.671	5.872	36.545	13.472	0	29.2	92.372	17.68	2.238	6.036	92.334	9.758	0.721	12.319	50.509	2.682	3.069	3.456
65	108.592	1.809	0.664	2.676	108.723	2.846	0.518	4.726	105.912	2.725	0.642	3.546	194.83	2.789	0.505	4.312	98.288	3.619	0.706	3.29	97.407	4.34	0.822	2.955	146.712	14.015	2.18	4.935	718.276	52.635	3.732	4.453	146.714	13.403	2.043	8.188	163.557	23.974	2.564	9.241	118.15	33.717	0	91.271	146.324	28.007	2.851	8.972	146.264	15.458	0.918	19.485	119.691	2.631	3.129	4.455

Pollutant Name: Oxides of Nitrogen Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	3.181	0.389	2.038	0.415	3.139	0.526	2.052	0.672	3.079	0.826	2	0.847	5.128	0.948	2.067	0.985	1.686	0.52	6.808	2.284	1.659	0.648	8.412	4.829	2.507	2.253	14.476	12.8	18.292	7.682	42.457	42.068	2.507	2.936	13.804	8.755	3.01	5.19	35.906	27.64	0.967	1.137	0	1.021	2.495	3.199	20.459	17.805	2.493	1.45	14.228	2.309	0.614	34.109	5.817
35	4.213	0.218	1.132	0.253	4.158	0.291	1.14	0.419	4.078	0.449	1.111	0.48	6.792	0.519	1.148	0.572	2.198	0.679	3.782	1.554	2.164	0.845	4.672	2.911	3.269	2.939	8.04	7.343	23.856	10.018	16.268	16.201	3.269	3.829	7.667	5.881	3.925	6.769	15.224	12.934	1.257	1.044	0	1.189	3.254	4.172	11.364	10.246	3.252	1.891	7.903	2.726	3.046	0.372	13.507	2.442
45	4.577	0.21	1.236	0.247	4.517	0.284	1.245	0.426	4.43	0.434	1.213	0.468	7.379	0.503	1.253	0.561	2.369	0.731	4.13	1.689	2.332	0.91	5.102	3.173	3.523	3.167	8.78	8.012	25.71	10.797	15.91	15.856	3.524	4.126	8.372	6.397	4.23	7.295	17.063	14.419	1.358	1.093	0	1.274	3.507	4.496	12.409	11.18	3.505	2.038	8.63	2.953	3.304	0.366	13.383	2.422
65	5.316	0.244	2.257	0.289	5.246	0.349	2.272	0.563	5.144	0.524	2.215	0.566	8.569	0.608	2.289	0.677	2.711	0.837	7.54	2.72	2.669	1.042	9.316	5.501	4.032	3.624	16.03	14.33	29.419	12.354	17.066	17.017	4.032	4.721	15.286	10.377	4.841	8.347	39.052	30.781	1.557	1.31	0	1.479	4.013	5.145	22.656	19.956	4.01	2.332	15.756	4.136	3.826	0.434	15.637	2.835

Pollutant Name: Carbon Dioxide Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	1313.986	955.789	359.913	957.474	1315.764	1184.547	346.655	1134.404	1316.601	1185.771	354.445	1184.608	1654.302	1625.532	347.114	1621.366	2513.51	2513.51	521.016	1956.641	2513.51	2513.51	532.653	1448.076	2513.51	2513.51	1505	1643.461	2513.51	2513.51	3845.361	3830.347	2513.51	2513.51	1505	1973.225	2513.51	2513.51	2620.111	2591.475	226.077	262.946	0	237.814	2513.51	2513.51	1505	1659.269	2513.51	2513.51	1505	2383.69	903.095	1181.086	3101.011	1473.737
35	427.432	310.912	359.913	311.963	428.01	385.326	346.655	383.713	428.282	385.724	354.445	385.982	538.135	528.776	347.114	528.226	497.421	497.421	521.016	504.015	497.421	497.421	532.653	516.371	497.421	497.421	1505	1366.667	497.421	497.421	1827.808	1812.812	497.421	497.421	1505	1037.207	497.421	497.421	2620.111	2049.902	111.774	138.183	0	120.181	497.421	497.421	1505	1350.874	497.421	497.421	1505	627.121	298.674	372.931	1610.303	563.108
45	395.857	287.945	359.913	288.973	396.392	356.861	346.655	356.976	396.645	357.23	354.445	357.539	498.382	489.714	347.114	489.293	450.085	450.085	521.016	469.909	450.085	450.085	532.653	494.495	450.085	450.085	1505	1360.168	450.085	450.085	1701.031	1686.93	450.085	450.085	1505	1015.23	450.085	450.085	2620.111	2037.186	100.011	142.842	0	113.646	450.085	450.085	1505	1343.633	450.085	450.085	1505	585.878	274.684	345.058	1516.631	525.12
65	530.579	385.941	359.913	387.066	531.297	478.312	346.655	471.053	531.635	478.807	354.445	478.899	667.997	656.379	347.114	655.408	712.968	712.968	521.016	659.32	712.968	712.968	532.653	615.983	712.968	712.968	1505	1396.26	712.968	712.968	1711.772	1700.513	712.968	712.968	1505	1137.28	712.968	712.968	2620.111	2107.803	96.378	233.137	0	139.914	712.968	712.968	1505	1383.845	712.968	712.968	1505	814.922	355.729	466.572	1524.567	628.472

Pollutant Name: Sulfur Dioxide Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0.016	0.009	0.003	0.009	0.016	0.011	0.003	0.011	0.016	0.011	0.003	0.012	0.021	0.016	0.003	0.016	0.03	0.024	0.005	0.019	0.03	0.024	0.005	0.014	0.033	0.025	0.014	0.016	0.065	0.027	0.037	0.037	0.033	0.025	0.014	0.019	0.034	0.026	0.025	0.025	0.003	0.003	0	0.003	0.033	0.026	0.014	0.016	0.033	0.025	0.014	0.024	0.011	0.011	0.03	0.014
35	0.005	0.003	0.003	0.003	0.005	0.004	0.003	0.004	0.005	0.004	0.003	0.004	0.007	0.005	0.003	0.005	0.006	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.006	0.005	0.014	0.013	0.005	0.017	0.017	0.017	0.006	0.005	0.014	0.01	0.007	0.005	0.025	0.02	0.002	0.002	0	0.002	0.006	0.005	0.014	0.013	0.006	0.005	0.014	0.006	0.004	0.004	0.015	0.005
45	0.005	0.003	0.003	0.003	0.005	0.003	0.003	0.003	0.005	0.003	0.003	0.003	0.006	0.005	0.003	0.005	0.005	0.005	0.005	0.005	0.004	0.005	0.005	0.005	0.006	0.004	0.014	0.013	0.011	0.005	0.016	0.016	0.006	0.004	0.014	0.01	0.006	0.005	0.025	0.02	0.002	0.002	0	0.002	0.006	0.005	0.014	0.013	0.006	0.004	0.014	0.006	0.004	0.003	0.014	0.005
65	0.007	0.004	0.003	0.004	0.007	0.005	0.003	0.005	0.007	0.005	0.003	0.005	0.01	0.006	0.003	0.006	0.008	0.007	0.005	0.006	0.008	0.007	0.005	0.006	0.009	0.007	0.014	0.013	0.018	0.008	0.016	0.016	0.009	0.007	0.014	0.011	0.009	0.007	0.025	0.02	0.003	0.003	0	0.003	0.009	0.007	0.014	0.013	0.009	0.007	0.014	0.008	0.005	0.005	0.015	0.006

Pollutant Name: PM10 Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0.104	0.059	0.35	0.06	0.102	0.062	0.139	0.068	0.105	0.128	0.281	0.129	0.106	0.118	0.136	0.118	0.101	0.035	0.114	0.057	0.101	0.042	0.147	0.099	0.101	0.061	0.912	0.795	0.101	0.094	2.922	2.89	0.101	0.068	0.867	0.496	0.101	0.098	0.961	0.729	0.08	0.005	0	0.056	0.101	0.082	1.361	1.165	0.101	0.02	0.544	0.091	0.093	0.082	2.298	0.425
35	0.027	0.01	0.114	0.01	0.026	0.011	0.045	0.013	0.027	0.022	0.092	0.022	0.027	0.02	0.044	0.021	0.015	0.005	0.037	0.014	0.015	0.006	0.048	0.029	0.015	0.009	0.297	0.257	0.015	0.014	0.571	0.565	0.015	0.01	0.282	0.156	0.015	0.014	0.237	0.177	0.038	0.002	0	0.027	0.015	0.012	0.443	0.377	0.015	0.003	0.177	0.026	0.031	0.014	0.467	0.084
45	0.024	0.008	0.093	0.009	0.024	0.009	0.037	0.011	0.025	0.019	0.075	0.019	0.025	0.017	0.036	0.017	0.011	0.004	0.031	0.011	0.011	0.005	0.039	0.023	0.011	0.007	0.244	0.211	0.011	0.01	0.534	0.528	0.011	0.007	0.232	0.128	0.011	0.011	0.196	0.146	0.043	0.002	0	0.03	0.011	0.009	0.364	0.309	0.011	0.002	0.145	0.021	0.032	0.012	0.431	0.077
65	0.035	0.011	0.082	0.011	0.035	0.012	0.033	0.013	0.036	0.024	0.066	0.024	0.036	0.022	0.032	0.022	0.01	0.003	0.027	0.01	0.01	0.004	0.034	0.02	0.01	0.006	0.213	0.185	0.01	0.009	0.896	0.886	0.01	0.007	0.203	0.112	0.01	0.009	0.206	0.153	0.095	0.005	0	0.066	0.01	0.008	0.319	0.271	0.01	0.002	0.127	0.018	0.06	0.015	0.695	0.121

Pollutant Name: PM10 - Tire Wear Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.012	0.012	0.012	0.012	0.008	0.009	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.029	0.011
35	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.012	0.012	0.012	0.012	0.008	0.009	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.029	0.011
45	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.012	0.012	0.012	0.012	0.008	0.009	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.029	0.011
65	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.012	0.012	0.012	0.012	0.008	0.009	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.029	0.011

Pollutant Name: PM10 - Brake Wear Temperature: 67F Relative Humidity: 55%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
5	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.01	0.013	0.024	0.014
35	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.01	0.013	0.024	0.014
45	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013

E.5-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	Existing					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	Winton Wy / Bellevue Rd	Signalized	C	27.7	1615	C	28.5	1716
2	Atwater Blvd / Applegate Rd	Signalized	C	29.6	1501	C	31.5	2032
3	Sycamore Ave / SR-99 NB Ramps	Unsignalized	A	7.9	377	A	8.1	418
4	Sycamore Ave / Applegate Rd	Signalized	C	20.0	898	C	23.1	1322
5	Bell Ln / Mall Access / SR-99 SB Ramps	Signalized	C	24.4	482	C	24.4	524
6	Bell Dr / Bell Ln	Signalized	C	20.0	656	B	19.4	704
7	Bell Dr / Commerce Ave / Applegate Rd	Signalized	C	26.8	1009	C	31.0	1442
8	Mall Access / Applegate Rd	Unsignalized	A	0.2	733	A	0.1	1115
9	Santa Fe Dr / Buhach Rd / Airdrome Entry	Signalized	C	21.4	1045	C	23.5	1094
10	Buhach Rd / Bellevue Rd	Signalized	C	25.2	928	C	27.2	1144
11	Ashby Rd / Buhach Rd	Unsignalized	D	14.5	1214	E	23.0	1364
12	Ashby Rd / N 193	Unsignalized	D	7.4	1043	C	4.0	951
13	Ashby Rd / SR-99 SB Ramps	Unsignalized	B	2.6	816	B	3.3	820
14	Santa Fe Dr / Bellevue Rd	Signalized	B	15.2	1034	B	10.9	1275
15	Santa Fe Dr / F St	Signalized	A	7.4	1191	A	8.8	1390
16	Santa Fe Dr / W Ave 2	Unsignalized	C	4.0	1612	B	2.8	1677
17	Santa Fe Dr / N Franklin Rd	Signalized	B	17.0	1832	B	16.0	2048
18	Ashby Rd / Franklin Rd	Unsignalized	B	11.7	924	B	12.5	974
19	Santa Fe Dr / Belcher Ave	Unsignalized	B	2.8	1478	B	3.2	1791
20	Olive Ave - Santa Fe Dr / SR-59	Signalized	D	35.4	2219	D	39.4	3161
21	Santa Fe Dr/ AM Express WB Ramps	Signalized	-	-	-	-	-	-
22	Santa Fe Dr/ AM Express EB Ramps	Signalized	-	-	-	-	-	-
23	SR-99 NB Ramps/AM Express	Signalized	-	-	-	-	-	-
24	SR-99 SB Ramps/AM Express	Signalized	-	-	-	-	-	-
25	16th St / SR-59	Unsignalized	C	9.1	1360	F	22.9	1961
26	13th St - SR-99 SB Off-Ramp / V St	Signalized	C	32.2	2080	C	33.1	2311
27	14th St - SR-99 NB Onramp / V St	Signalized	B	18.6	1545	B	18.0	1990
28	15th St / V St	Signalized	B	16.7	1299	C	25.0	1867
29	16th St / V St	Signalized	C	21.5	2067	C	27.0	2640
30	13th St / R St	Signalized	B	14.3	1466	B	15.0	1811
31	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	B	20.0	1449	B	19.0	1809
32	15th St / R St	Signalized	B	17.1	1141	C	25.2	1892
33	16th St / R St	Signalized	C	31.8	1838	C	33.7	2861
34	*Olive Ave / R St*	*Signalized*	*D*	*50.9*	*2490*	*E*	*56.2*	*3810*
35	15th St / O St	Unsignalized	A	7.6	291	A	8.5	511
36	16th St / O St	Signalized	C	21.1	1015	B	19.8	1585

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

E.5-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Control	Existing					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
37	15th St / M St	Unsignalized	B	11.0	822	B	12.7	992
38	16th St / M St	Signalized	C	32.9	1570	C	33.7	2297
39	*Olive Ave / M St*	*Signalized*	*D*	*54.5*	*3042*	*E*	*58.6*	*3971*
40	2nd St / Grogan Ave / Northwest Ave	Unsignalized	A	9.8	581	B	10.0	640
41	Childs Ave / Martin Luther King Wy	Signalized	D	39.2	1231	D	41.2	1516
42	13th St / Martin Luther King Wy	Signalized	C	25.7	1149	C	27.4	1495
43	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	C	5.6	1138	C	3.8	1264
44	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	C	3.8	1104	C	3.1	1325
45	14th St / Martin Luther King Wy	Unsignalized	C	1.4	871	C	2.2	1254
46	15th St / Martin Luther King Wy	Signalized	B	12.4	856	B	14.8	1306
47	16th St / Martin Luther King Wy	Signalized	C	29.1	1337	C	31.2	2015
48	13th St / G St	Signalized	B	12.9	1021	C	15.4	1219
49	SR-99 - 14th St / G St	Unsignalized	B	1.3	869	B	1.1	990
50	16th St / G Street	Signalized	C	31.4	1917	C	32.8	2374
51	Olive Ave / G St	Signalized	D	46.8	3187	D	48.0	3666
52	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	B	6.0	810	D	7.1	1003
53	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	E	19.1	1069	F	30.8	1170
54	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	D	3.1	1536	F	11.3	1689
55	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Unsignalized	D	42.6	1630	D	36.9	1685
56	14th St / O St	Unsignalized	A	2.6	164	B	3.8	296
57	13th St / M St	Unsignalized	B	12.7	955	C	15.8	1106
58	14th St / M St	Unsignalized	B	0.9	664	C	1.7	762
59	Main St / M St	Signalized	A	9.7	1566	B	13.2	1858
60	18th St / M St	Signalized	B	12.2	1439	B	13.5	1555
61	15th St / Canal St	Unsignalized	B	5.1	256	B	7.5	493
62	16th St / Canal St	Unsignalized	C	1.6	1106	C	2.0	1447
63	11th St / Martin Luther King Wy	Unsignalized	C	1.9	957	C	3.1	1119
64	Main St / Martin Luther King Wy	Signalized	A	9.5	513	A	9.9	814
65	18th St / Martin Luther King Wy	Unsignalized	A	7.7	252	A	8.0	347
66	16th St / H St	Unsignalized	B	0.6	731	B	1.0	980
67	Main St / H St	Unsignalized	A	1.5	252	B	2.1	398
68	15th St / G St	Unsignalized	B	1.6	708	C	3.3	910
69	Main St / G St	Signalized	B	16.8	877	C	20.1	919
70	18th St / G St	Signalized	A	8.5	749	A	4.5	601
71	15th St / D St	Unsignalized	B	8.1	363	B	8.4	364
72	16th St / D St	Unsignalized	A	4.0	670	B	3.4	943

Intersections selected for analysis are italicized
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E.5-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Sum

#	Intersection	Control	Existing + Project					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	Winton Wy / Bellevue Rd	Signalized	C	29.8	1838	C	31.7	2020
2	Atwater Blvd / Applegate Rd	Signalized	C	30.1	1724	D	35.6	2336
3	Sycamore Ave / SR-99 NB Ramps	Unsignalized	A	8.9	409	A	9.3	474
4	Sycamore Ave / Applegate Rd	Signalized	C	20.6	1121	C	27.1	1626
5	Bell Ln / Mall Access / SR-99 SB Ramps	Signalized	C	24.3	644	C	24.7	743
6	Bell Dr / Bell Ln	Signalized	B	19.7	818	B	18.9	923
7	Bell Dr / Commerce Ave / Applegate Rd	Signalized	C	26.5	1201	C	28.8	1691
8	Mall Access / Applegate Rd	Unsignalized	A	9.2	924	A	9.8	1363
9	Santa Fe Dr / Buhach Rd / Airdrome Entry	Signalized	C	24.3	1772	C	27.1	1823
10	Buhach Rd / Bellevue Rd	Signalized	C	28.0	1325	C	29.1	1622
11	Ashby Rd / Buhach Rd	Unsignalized	F	206.3	1388	F	219.2	1538
12	Ashby Rd / N 193	Unsignalized	D	31.8	1117	C	24.4	1059
13	Ashby Rd / SR-99 SB Ramps	Unsignalized	B	11.1	882	B	11.4	920
14	Santa Fe Dr / Bellevue Rd	Signalized	B	13.3	1330	B	10.7	1490
15	Santa Fe Dr / F St	Signalized	A	7.1	1487	A	8.1	1605
16	Santa Fe Dr / W Ave 2	Unsignalized	C	15.7	1908	B	15.0	1892
17	Santa Fe Dr / N Franklin Rd	Signalized	C	23.4	2129	B	19.2	2264
18	Ashby Rd / Franklin Rd	All-Way Stop	C	15.8	1111	B	14.4	1080
19	Santa Fe Dr / Belcher Ave	Unsignalized	B	11.0	1580	C	15.2	1893
20	Olive Ave - Santa Fe Dr / SR-59	Signalized	D	35.5	2347	D	39.9	3289
21	Santa Fe Dr/ AM Express WB Ramps	Signalized	-	-	-	-	-	-
22	Santa Fe Dr/ AM Express EB Ramps	Signalized	-	-	-	-	-	-
23	SR-99 NB Ramps/AM Express	Signalized	-	-	-	-	-	-
24	SR-99 SB Ramps/AM Express	Signalized	-	-	-	-	-	-
25	16th St / SR-59	Unsignalized	C	17.0	1414	F	136.2	2020
26	13th St - SR-99 SB Off-Ramp / V St	Signalized	D	35.6	2439	D	35.8	2526
27	14th St - SR-99 NB Onramp / V St	Signalized	B	18.9	1753	C	20.8	2368
28	15th St / V St	Signalized	B	16.1	1357	C	24.6	1925
29	16th St / V St	Signalized	C	21.8	2179	C	28.2	2757
30	13th St / R St	Signalized	B	14.8	1777	B	15.6	1973
31	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	21.3	1668	C	22.9	2114
32	15th St / R St	Signalized	B	16.5	1246	C	24.9	1960
33	16th St / R St	Signalized	C	32.2	2017	C	33.9	3043
34	*Olive Ave / R St*	*Signalized*	*D*	*50.9*	*2506*	*E*	*56.2*	*3826*
35	15th St / O St	All-Way Stop	A	7.9	360	A	8.9	587
36	16th St / O St	Signalized	B	19.1	1186	B	18.5	1757

Intersections selected for analysis are italicized

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E.5-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Sum

#	Intersection	Control	Existing + Project					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
37	15th St / M St	All-Way Stop	F	70.5	1595	F	137.2	1851
38	16th St / M St	Signalized	D	35.4	2155	D	37.1	2964
39	*Olive Ave / M St*	*Signalized*	*D*	*54.5*	*3058*	*E*	*58.6*	*3987*
40	2nd St / Grogan Ave / Northwest Ave	All-Way Stop	A	9.8	581	B	10.0	640
41	Childs Ave / Martin Luther King Wy	Signalized	D	38.3	1289	D	40.8	1574
42	13th St / Martin Luther King Wy	Signalized	C	28.8	1248	C	30.4	1591
43	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	C	22.9	1205	C	17.0	1216
44	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	C	21.6	1128	C	21.8	1293
45	14th St / Martin Luther King Wy	Unsignalized	C	20.6	974	F	56.6	1394
46	15th St / Martin Luther King Wy	-	-	-	-	-	-	-
47	16th St / Martin Luther King Wy	-	-	-	-	-	-	-
48	13th St / G St	All-Way Stop	E	37.2	1389	F	51.0	1587
49	SR-99 - 14th St / G St	Unsignalized	C	17.7	976	C	21.7	1206
50	16th St / G Street	-	-	-	-	-	-	-
51	Olive Ave / G St	Signalized	D	46.8	3204	D	48.0	3683
52	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	A	9.5	298	B	13.0	450
53	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	B	13.9	619	C	16.9	713
54	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	69.8	1564	F	538.2	1719
55	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Signalized	D	45.0	1663	D	38.8	1718
56	14th St / O St	Unsignalized	B	11.1	300	C	16.7	599
57	13th St / M St	All-Way Stop	D	28.6	1264	D	29.0	1346
58	14th St / M St	Unsignalized	C	18.1	1197	C	24.8	1318
59	Main St / M St	Signalized	A	9.7	1636	B	13.4	1966
60	18th St / M St	Signalized	B	12.2	1475	B	13.8	1591
61	15th St / Canal St	All-Way Stop	B	10.6	714	B	13.6	977
62	16th St / Canal St	Unsignalized	E	35.5	1512	F	67.0	1848
63	11th St / Martin Luther King Wy	Unsignalized	C	17.6	1013	C	21.9	1175
64	Main St / Martin Luther King Wy	Signalized	B	10.2	983	B	11.3	1556
65	18th St / Martin Luther King Wy	All-Way Stop	A	7.7	272	A	8.1	367
66	16th St / H St	Signalized	C	24.3	980	C	24.1	1313
67	Main St / H St	Unsignalized	C	21.1	915	E	41.5	1155
68	15th St / G St	-	-	-	-	-	-	-
69	Main St / G St	Signalized	C	20.8	1614	C	24.9	1963
70	18th St / G St	Signalized	A	9.9	1015	B	11.2	1042
71	15th St / D St	-	-	-	-	-	-	-
72	16th St / D St	-	-	-	-	-	-	-

Intersections selected for analysis are italicized
- Indicates intersection does not exist for a particular scenario

E.5-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Sum

#	Intersection	Control	Existing + Project					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	Winton Wy / Bellevue Rd	Signalized	C	29.8	1838	C	31.7	2020
2	Atwater Blvd / Applegate Rd	Signalized	C	30.1	1724	D	35.6	2336
3	Sycamore Ave / SR-99 NB Ramps	Unsignalized	A	8.9	409	A	9.3	474
4	Sycamore Ave / Applegate Rd	Signalized	C	20.6	1121	C	27.1	1626
5	Bell Ln / Mall Access / SR-99 SB Ramps	Signalized	C	24.3	644	C	24.7	743
6	Bell Dr / Bell Ln	Signalized	B	19.7	818	B	18.9	923
7	Bell Dr / Commerce Ave / Applegate Rd	Signalized	C	26.5	1201	C	28.8	1691
8	Mall Access / Applegate Rd	Unsignalized	A	9.2	924	A	9.8	1363
9	Santa Fe Dr / Buhach Rd / Airdrome Entry	Signalized	C	24.3	1772	C	27.1	1823
10	Buhach Rd / Bellevue Rd	Signalized	C	28.0	1325	C	29.1	1622
11	Ashby Rd / Buhach Rd	Unsignalized	F	206.3	1388	F	219.2	1538
12	Ashby Rd / N 193	Unsignalized	D	31.8	1117	C	24.4	1059
13	Ashby Rd / SR-99 SB Ramps	Unsignalized	B	11.1	882	B	11.4	920
14	Santa Fe Dr / Bellevue Rd	Signalized	B	13.3	1330	B	10.7	1490
15	Santa Fe Dr / F St	Signalized	A	7.1	1487	A	8.1	1605
16	Santa Fe Dr / W Ave 2	Unsignalized	C	15.7	1908	B	15.0	1892
17	Santa Fe Dr / N Franklin Rd	Signalized	C	23.4	2129	B	19.2	2264
18	Ashby Rd / Franklin Rd	All-Way Stop	C	15.8	1111	B	14.4	1080
19	Santa Fe Dr / Belcher Ave	Unsignalized	B	11.0	1580	C	15.2	1893
20	Olive Ave - Santa Fe Dr / SR-59	Signalized	D	35.5	2347	D	39.9	3289
21	Santa Fe Dr/ AM Express WB Ramps	Signalized	-	-	-	-	-	-
22	Santa Fe Dr/ AM Express EB Ramps	Signalized	-	-	-	-	-	-
23	SR-99 NB Ramps/AM Express	Signalized	-	-	-	-	-	-
24	SR-99 SB Ramps/AM Express	Signalized	-	-	-	-	-	-
25	16th St / SR-59	Unsignalized	C	17.0	1414	F	136.2	2020
26	13th St - SR-99 SB Off-Ramp / V St	Signalized	D	36.4	2480	D	36.7	2589
27	14th St - SR-99 NB Onramp / V St	Signalized	B	18.8	1786	C	20.9	2369
28	15th St / V St	Signalized	B	15.8	1399	C	24.3	1965
29	16th St / V St	Signalized	C	22.1	2222	C	28.7	2800
30	13th St / R St	Signalized	B	14.8	1728	B	15.6	1962
31	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	21.2	1605	C	21.9	2030
32	15th St / R St	Signalized	B	16.8	1198	C	24.9	1945
33	16th St / R St	Signalized	C	32.2	2025	C	33.9	3050
34	*Olive Ave / R St*	*Signalized*	*D*	*50.9*	*2506*	*E*	*56.2*	*3826*
35	15th St / O St	All-Way Stop	A	7.7	307	A	8.8	562
36	16th St / O St	Signalized	B	19.0	1195	B	18.4	1768

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

E.5-1 Castle Commerce Center HMF Site

Intersection Control, LOS, Average Delay, and Total Volume Sum

#	Intersection	Control	Existing + Project					
			AM Peak			PM Peak		
			LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
37	15th St / M St	All-Way Stop	D	30.9	1385	F	81.6	1643
38	16th St / M St	Signalized	D	35.4	2150	D	37.0	2961
39	*Olive Ave / M St*	*Signalized*	*D*	*54.5*	*3058*	*E*	*58.6*	*3987*
40	2nd St / Grogan Ave / Northwest Ave	All-Way Stop	A	10.0	666	B	10.6	725
41	Childs Ave / Martin Luther King Wy	Signalized	D	38.8	1295	D	41.6	1580
42	13th St / Martin Luther King Wy	Signalized	C	28.1	1322	C	30.1	1658
43	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	C	18.3	1202	C	16.2	1268
44	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	C	20.3	1053	D	25.9	1287
45	14th St / Martin Luther King Wy	Unsignalized	C	16.5	877	E	46.6	1326
46	15th St / Martin Luther King Wy	-	-	-	-	-	-	-
47	16th St / Martin Luther King Wy	-	-	-	-	-	-	-
48	13th St / G St	All-Way Stop	E	41.6	1416	F	55.1	1612
49	SR-99 - 14th St / G St	Unsignalized	C	17.6	994	C	22.0	1225
50	16th St / G Street	-	-	-	-	-	-	-
51	Olive Ave / G St	Signalized	D	46.8	3204	D	48.0	3683
52	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	A	9.5	289	B	12.8	441
53	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	B	13.7	610	C	16.6	704
54	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	68.6	1564	F	541.6	1719
55	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Signalized	D	45.0	1663	D	38.8	1718
56	14th St / O St	Unsignalized	B	10.9	280	B	14.3	514
57	13th St / M St	All-Way Stop	D	27.9	1254	D	28.2	1339
58	14th St / M St	Unsignalized	C	19.3	1065	C	23.1	1159
59	Main St / M St	Signalized	A	9.7	1633	B	13.4	1963
60	18th St / M St	Signalized	B	12.3	1477	B	13.8	1593
61	15th St / Canal St	All-Way Stop	A	8.6	495	B	10.2	758
62	16th St / Canal St	Unsignalized	E	35.5	1509	F	66.3	1845
63	11th St / Martin Luther King Wy	Unsignalized	C	19.8	1088	C	21.9	1253
64	Main St / Martin Luther King Wy	Signalized	B	10.2	981	B	11.3	1554
65	18th St / Martin Luther King Wy	All-Way Stop	A	7.7	274	A	8.1	369
66	16th St / H St	Signalized	C	24.2	977	C	24.1	1309
67	Main St / H St	Unsignalized	C	21.3	918	E	42.5	1158
68	15th St / G St	-	-	-	-	-	-	-
69	Main St / G St	Signalized	C	20.9	1632	C	25.1	1980
70	18th St / G St	Signalized	A	9.9	1016	B	11.2	1043
71	15th St / D St	-	-	-	-	-	-	-
72	16th St / D St	-	-	-	-	-	-	-

Intersections selected for analysis are italicized
- Indicates intersection does not exist for a particular scenario

E.5-2 Merced HST Station

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Existing						
			AM Peak			PM Peak		
		Control	LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	16th St / SR-59	Unsignalized	C	9.1	1,360	F	22.9	1,961
2	Olive Ave - Santa Fe Dr / SR-59	Signalized	D	35.4	2,219	D	39.4	3,161
3	13th St - SR-99 SB Off-Ramp / V St	Signalized	C	32.2	2,080	C	33.1	2,311
4	14th St - SR-99 NB Onramp / V St	Signalized	B	18.6	1,545	B	18.0	1,990
5	15th St / V St	Signalized	B	16.7	1,299	C	25.0	1,867
6	16th St / V St	Signalized	C	21.5	2,067	C	27.0	2,640
7	13th St / R St	Signalized	B	14.3	1,466	B	15.0	1,811
8	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	B	20.0	1,449	B	19.0	1,809
9	15th St / R St	Signalized	B	17.1	1,141	C	25.2	1,892
10	16th St / R St	Signalized	C	31.8	1,838	C	33.7	2,861
11	***Olive Ave / R St***	***Signalized***	***D***	***50.9***	***2,490***	***E***	***56.2***	***3,810***
12	15th St / O St	Unsignalized	A	7.6	291	A	8.5	511
13	16th St / O St	Signalized	C	21.1	1,015	B	19.8	1,585
14	15th St / M St	Unsignalized	B	11.0	822	B	12.7	992
15	16th St / M St	Signalized	C	32.9	1,570	C	33.7	2,297
16	***Olive Ave / M St***	***Signalized***	***D***	***54.5***	***3,042***	***E***	***58.6***	***3,971***
17	2nd St / Grogan Ave / Northwest Ave	Unsignalized	A	9.8	581	B	10.0	640
18	Childs Ave / Martin Luther King Wy	Signalized	D	39.2	1,231	D	41.2	1,516
19	13th St / Martin Luther King Wy	Signalized	C	25.7	1,149	C	27.4	1,495
20	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	C	5.6	1,138	C	3.8	1,264
21	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	C	3.8	1,104	C	3.1	1,325
22	14th St / Martin Luther King Wy	Unsignalized	C	1.4	871	C	2.2	1,254
23	15th St / Martin Luther King Wy	Signalized	B	12.4	856	B	14.8	1,306
24	16th St / Martin Luther King Wy	Signalized	C	29.1	1,337	C	31.2	2,015
25	13th St / G St	Signalized	B	12.9	1,021	C	15.4	1,219
26	SR-99 - 14th St / G St	Unsignalized	B	1.3	869	B	1.1	990
27	16th St / G Street	Signalized	C	31.4	1,917	C	32.8	2,374
28	Olive Ave / G St	Signalized	D	46.8	3,187	D	48.0	3,666
29	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	B	6.0	810	D	7.1	1,003
30	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	E	19.1	1,069	F	30.8	1,170
31	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	D	3.1	1,536	F	11.3	1,689
32	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Unsignalized	D	42.6	1,630	D	36.9	1,685
33	14th St / O St	Unsignalized	A	2.6	164	B	3.8	296
34	13th St / M St	Unsignalized	B	12.7	955	C	15.8	1,106
35	14th St / M St	Unsignalized	B	0.9	664	C	1.7	762
36	Main St / M St	Signalized	A	9.7	1,566	B	13.2	1,858
37	18th St / M St	Signalized	B	12.2	1,439	B	13.5	1,555
38	15th St / Canal St	Unsignalized	B	5.1	256	B	7.5	493
39	16th St / Canal St	Unsignalized	C	1.6	1,106	C	2.0	1,447
40	11th St / Martin Luther King Wy	Unsignalized	C	1.9	957	C	3.1	1,119
41	Main St / Martin Luther King Wy	Signalized	A	9.5	513	A	9.9	814
42	18th St / Martin Luther King Wy	Unsignalized	A	7.7	252	A	8.0	347
43	16th St / H St	Unsignalized	B	0.6	731	B	1.0	980
44	Main St / H St	Unsignalized	A	1.5	252	B	2.1	398
45	15th St / G St	Unsignalized	B	1.6	708	C	3.3	910
46	Main St / G St	Signalized	B	16.8	877	C	20.1	919
47	18th St / G St	Signalized	A	8.5	749	A	4.5	601
48	15th St / D St	Unsignalized	B	8.1	363	B	8.4	364
49	16th St / D St	Unsignalized	A	4.0	670	B	3.4	943

Intersections selected for analysis are italicized
- Indicates intersection does not exist for a particular scenario

E.5-2 Merced HST Station

Intersection Control, LOS, Average Delay, and Total Vc

#	Intersection	Existing + Project						
			AM Peak			PM Peak		
		Control	LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	16th St / SR-59	Unsignalized	C	17.0	1,414	F	136.2	2,020
2	Olive Ave - Santa Fe Dr / SR-59	Signalized	D	35.4	2,244	D	39.5	3,186
3	13th St - SR-99 SB Off-Ramp / V St	Signalized	D	35.6	2,439	D	35.8	2,526
4	14th St - SR-99 NB Onramp / V St	Signalized	B	18.9	1,753	C	20.8	2,368
5	15th St / V St	Signalized	B	16.1	1,357	C	24.6	1,925
6	16th St / V St	Signalized	C	21.8	2,179	C	28.2	2,757
7	13th St / R St	Signalized	B	14.8	1,777	B	15.6	1,973
8	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	21.3	1,668	C	22.9	2,114
9	15th St / R St	Signalized	B	16.5	1,246	C	24.9	1,960
10	16th St / R St	Signalized	C	32.2	2,017	C	33.9	3,043
11	***Olive Ave / R St***	***Signalized***	***D***	***50.9***	***2,506***	***E***	***56.2***	***3,826***
12	15th St / O St	All-Way Stop	A	7.9	360	A	8.9	587
13	16th St / O St	Signalized	B	19.1	1,186	B	18.5	1,757
14	15th St / M St	All-Way Stop	E	45.6	1,443	F	73.4	1,611
15	16th St / M St	Signalized	C	34.9	2,021	D	35.1	2,748
16	***Olive Ave / M St***	***Signalized***	***D***	***54.5***	***3,058***	***E***	***58.6***	***3,987***
17	2nd St / Grogan Ave / Northwest Ave	All-Way Stop	A	9.8	581	B	10.0	640
18	Childs Ave / Martin Luther King Wy	Signalized	D	38.3	1,289	D	40.8	1,574
19	13th St / Martin Luther King Wy	Signalized	C	27.0	1,248	C	28.8	1,591
20	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	D	28.1	1,290	C	20.5	1,353
21	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	C	23.8	1,213	D	25.5	1,430
22	14th St / Martin Luther King Wy	Unsignalized	C	22.1	1,028	E	37.8	1,434
23	15th St / Martin Luther King Wy	Signalized	B	11.0	841	B	14.0	1,248
24	16th St / Martin Luther King Wy	Signalized	C	29.0	1,746	C	33.7	2,424
25	13th St / G St	All-Way Stop	E	37.2	1,389	F	51.0	1,587
26	SR-99 - 14th St / G St	Unsignalized	C	17.7	976	C	21.7	1,206
27	16th St / G Street	-	-	-	-	-	-	-
28	Olive Ave / G St	Signalized	D	46.8	3,204	D	48.0	3,683
29	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	A	9.5	298	B	13.0	450
30	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	B	13.9	619	C	16.9	713
31	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	69.8	1,564	F	538.2	1,719
32	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Signalized	D	45.0	1,663	D	38.8	1,718
33	14th St / O St	Unsignalized	B	11.1	300	C	16.7	599
34	13th St / M St	All-Way Stop	D	27.6	1,242	D	25.6	1,291
35	14th St / M St	Unsignalized	C	17.7	1,175	C	23.1	1,263
36	Main St / M St	Signalized	A	9.6	1,606	B	13.1	1,898
37	18th St / M St	Signalized	B	12.2	1,475	B	13.8	1,591
38	15th St / Canal St	Unsignalized	B	14.9	637	C	22.1	874
39	16th St / Canal St	Unsignalized	E	37.3	1,515	F	70.5	1,856
40	11th St / Martin Luther King Wy	Unsignalized	C	17.6	1,013	C	21.9	1,175
41	Main St / Martin Luther King Wy	Signalized	A	9.5	517	A	9.9	818
42	18th St / Martin Luther King Wy	All-Way Stop	A	7.7	272	A	8.1	367
43	16th St / H St	Signalized	C	6.5	980	E	6.8	1,313
44	Main St / H St	Unsignalized	C	21.1	915	E	41.5	1,155
45	15th St / G St	-	-	-	-	-	-	-
46	Main St / G St	Signalized	C	20.8	1,614	C	24.9	1,963
47	18th St / G St	Signalized	A	9.9	1,015	B	11.2	1,042
48	15th St / D St	-	-	-	-	-	-	-
49	16th St / D St	-	-	-	-	-	-	-

Intersections selected for analysis are italicized
- Indicates intersection does not exist for a particular scenario

E.5-2 Merced HST Station

Intersection Control, LOS, Average Delay, and Total Vc

#	Intersection	Existing + Project						
			AM Peak			PM Peak		
		Control	LOS	Average Delay (sec)	Total Volume (vph)	LOS	Average Delay (sec)	Total Volume (vph)
1	16th St / SR-59	Unsignalized	C	17.0	1,414	F	136.2	2,020
2	Olive Ave - Santa Fe Dr / SR-59	Signalized	D	35.4	2,244	D	39.5	3,186
3	13th St - SR-99 SB Off-Ramp / V St	Signalized	D	36.4	2,480	D	36.7	2,589
4	14th St - SR-99 NB Onramp / V St	Signalized	B	18.8	1,786	C	20.9	2,369
5	15th St / V St	Signalized	B	15.8	1,399	C	24.3	1,965
6	16th St / V St	Signalized	C	22.1	2,222	C	28.7	2,800
7	13th St / R St	Signalized	B	14.8	1,728	B	15.6	1,962
8	SR-99 NB Off-Ramp - 14th St / R Street	Signalized	C	21.2	1,605	C	21.9	2,030
9	15th St / R St	Signalized	B	16.8	1,198	C	24.9	1,945
10	16th St / R St	Signalized	C	32.2	2,025	C	33.9	3,050
11	***Olive Ave / R St***	***Signalized***	***D***	***50.9***	***2,506***	***E***	***56.2***	***3,826***
12	15th St / O St	All-Way Stop	A	7.7	307	A	8.8	562
13	16th St / O St	Signalized	B	19.0	1,195	B	18.4	1,768
14	15th St / M St	All-Way Stop	C	21.1	1,233	D	32.0	1,403
15	16th St / M St	Signalized	C	34.8	2,016	C	35.0	2,745
16	***Olive Ave / M St***	***Signalized***	***D***	***54.5***	***3,058***	***E***	***58.6***	***3,987***
17	2nd St / Grogan Ave / Northwest Ave	All-Way Stop	A	10.0	666	B	10.6	725
18	Childs Ave / Martin Luther King Wy	Signalized	D	38.8	1,295	D	41.6	1,580
19	13th St / Martin Luther King Wy	Signalized	C	26.2	1,322	C	28.1	1,658
20	SR-99 SB Ramps / Martin Luther King Wy	Unsignalized	C	21.0	1,287	C	19.1	1,405
21	SR-99 NB Ramps / Martin Luther King Wy	Unsignalized	C	22.4	1,138	D	31.2	1,424
22	14th St / Martin Luther King Wy	Unsignalized	C	18.6	931	E	40.6	1,366
23	15th St / Martin Luther King Wy	Signalized	B	11.5	870	B	14.5	1,277
24	16th St / Martin Luther King Wy	Signalized	C	29.0	1,743	C	33.7	2,421
25	13th St / G St	All-Way Stop	E	41.6	1,416	F	55.1	1,612
26	SR-99 - 14th St / G St	Unsignalized	B	17.6	994	C	22.0	1,225
27	16th St / G Street	-	-	-	-	-	-	-
28	Olive Ave / G St	Signalized	D	46.8	3,204	D	48.0	3,683
29	SR-99 SB On-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	A	9.5	289	B	12.8	441
30	SR-99 SB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	B	13.7	610	C	16.6	704
31	SR-99 NB Off-Ramp / Yosemite Pkwy (SR-140)	Unsignalized	F	68.6	1,564	F	541.6	1,719
32	Motel Dr / Glen Ave / Yosemite Pkwy (SR-140)	Signalized	D	45.0	1,663	D	38.8	1,718
33	14th St / O St	Unsignalized	B	10.9	280	B	14.3	514
34	13th St / M St	All-Way Stop	D	27.0	1,232	D	25.1	1,284
35	14th St / M St	Unsignalized	C	18.8	1,043	C	21.6	1,104
36	Main St / M St	Signalized	A	9.6	1,603	B	13.1	1,895
37	18th St / M St	Signalized	B	12.3	1,477	B	13.8	1,593
38	15th St / Canal St	Unsignalized	B	11.7	418	B	14.5	655
39	16th St / Canal St	Unsignalized	E	37.2	1,512	F	69.8	1,853
40	11th St / Martin Luther King Wy	Unsignalized	C	19.8	1,088	C	21.9	1,253
41	Main St / Martin Luther King Wy	Signalized	A	9.5	515	A	9.9	816
42	18th St / Martin Luther King Wy	All-Way Stop	A	7.7	274	A	8.1	369
43	16th St / H St	Signalized	C	6.5	977	E	6.9	1,309
44	Main St / H St	Unsignalized	C	21.3	918	E	42.5	1,158
45	15th St / G St	-	-	-	-	-	-	-
46	Main St / G St	Signalized	C	20.9	1,632	C	25.1	1,980
47	18th St / G St	Signalized	A	9.9	1,016	B	11.2	1,043
48	15th St / D St	-	-	-	-	-	-	-
49	16th St / D St	-	-	-	-	-	-	-

Intersections selected for analysis are italicized
- Indicates intersection does not exist for a particular scenario

E.5-3 Herndon Ave and Shaw Ave Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	Existing						
			AM PEAK HOUR			PM PEAK HOUR		
		Control	LOS	Delay	Total Volume (AM)	LOS	Delay	Total Volume (PM)
1	GOLDEN STATE BLVD / SANTA ANA AVE	1-WAY STOP*	C	18.8	1,359	C	16.2	1,695
2	CORNELIA AVE / SANTA ANA AVE	Yield	A	7.0	23	A	6.8	11
5	CORNELIA AVE / SHAW AVE	2-WAY STOP*	E	36.4	1,987	E	44.9	2,161
6	GOLDEN STATE BLVD / SHAW AVE	SIGNAL	D	43.8	2,968	E	76.9	3,646
7	***BLYTHE AVE / SHAW AVE***	***SIGNAL***	***D***	***36.4***	***1,692***	***F***	***127.8***	***3,561***
8	***BRAWLEY AVE / SHAW AVE***	***SIGNAL***	***D***	***38.9***	***3,296***	***E***	***64.5***	***5,284***
9	CORNELIA AVE / GOLDEN STATE BLVD	1-WAY STOP*	C	18.5	1,121	D	30.9	949
10	FIGARDEN DR / GATES AVE	SIGNAL	B	15.8	2,190	C	21.2	2,961
11	***FIGARDEN DR / BULLARD AVE***	***SIGNAL***	***D***	***45.6***	***2,788***	***D***	***43.0***	***3,246***
12	DANTE AVE / BULLARD AVE	ALL-WAY STOP	B	10.9	825	B	10.6	961
13	POLK AVE / BULLARD AVE	ALL-WAY STOP	B	10.9	698	B	11.7	974
14	CARNEGIE AVE / BULLARD AVE	ALL-WAY STOP	C	16.8	942	C	21.7	972
15	GOLDEN STATE BLVD / CARNEGIE AVE	ALL-WAY STOP	E	45.7	951	C	23.3	1,113
16	VETERANS BLVD / BULLARD AVE	-	-	-	-	-	-	-
17	VETERANS BLVD / GOLDEN STATE BLVD CONNECTOR SOUTH	-	-	-	-	-	-	-
18	VETERANS BLVD / SR 99 NB RAMPS	-	-	-	-	-	-	-
19	VETERANS BLVD / SR 99 SB RAMPS	-	-	-	-	-	-	-

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

E.5-3 Herndon Ave and Shaw Ave Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

		Existing + Project						
			AM PEAK HOUR			PM PEAK HOUR		
#	Intersection	Control	LOS	Delay	Total Volume (AM)	LOS	Delay	Total Volume (PM)
1	GOLDEN STATE BLVD / SANTA ANA AVE	1-WAY STOP*	C	16.8	1,359	C	15.8	1,695
2	CORNELIA AVE / SANTA ANA AVE	Yield	B	12.6	736	D	28.9	1,023
5	CORNELIA AVE / SHAW AVE	2-WAY STOP*	F	OVFL	2,822	F	OVFL	3,335
6	GOLDEN STATE BLVD / SHAW AVE	NA	NA	NA	NA	NA	NA	NA
7	***BLYTHE AVE / SHAW AVE***	***SIGNAL***	***D***	***37.0***	***1,752***	***E***	***69.8***	***3,603***
8	***BRAWLEY AVE / SHAW AVE***	***SIGNAL***	***D***	***38.9***	***3,296***	***E***	***67.8***	***5,284***
9	CORNELIA AVE / GOLDEN STATE BLVD	1-WAY STOP*	C	18.2	1,115	C	19.1	942
10	FIGARDEN DR / GATES AVE	SIGNAL	B	16.1	2,250	D	44.9	3,003
11	***FIGARDEN DR / BULLARD AVE***	***SIGNAL***	***D***	***52.3***	***2,848***	***F***	***99.4***	***3,468***
12	DANTE AVE / BULLARD AVE	ALL-WAY STOP	B	10.6	855	B	10.3	974
13	POLK AVE / BULLARD AVE	ALL-WAY STOP	A	9.6	680	B	11.0	968
14	CARNEGIE AVE / BULLARD AVE	ALL-WAY STOP	B	10.4	681	B	10.4	813
15	GOLDEN STATE BLVD / CARNEGIE AVE	1-WAY STOP*	C	16.1	730.0	B	14.7	929.0
16	VETERANS BLVD / BULLARD AVE	-	-	-	-	-	-	-
17	VETERANS BLVD / GOLDEN STATE BLVD CONNECTOR SOUTH	1-WAY STOP	D	30.3	884	D	29.9	1,071
18	VETERANS BLVD / SR 99 NB RAMPS	-	-	-	-	-	-	-
19	VETERANS BLVD / SR 99 SB RAMPS	-	-	-	-	-	-	-

Intersections selected for analysis are italicized

- Indicates intersection does not exist for a particular scenario

E.5-4 SR-99 Realignment Area

Intersection Control, LOS, Average Delay, and Total Volume Summary

#	Intersection	2008 Existing						
			AM Peak Hour			PM Peak Hour		
		Control	LOS	Delay (sec)	Volume (veh)	LOS	Delay (sec)	Volume (veh)
1	McKinley Avenue and Woodson Avenue	U*	B	12	538	B	14	699
2	McKinley Avenue and SR-99 SB Ramp	U*	A	10	1031	A	9	955
3	McKinley Avenue and SR-99 NB Ramp	U*	C	17	1006	C	16	1048
4	McKinley Avenue and Motel Drive	S	B	15	1221	B	14	1457
5	Clinton Avenue and Brawley Avenue	S	B	15	1289	B	20	1765
6	Clinton Avenue and Marks Avenue	S	C	34	1888	D	45	2568
7	Clinton Avenue and Vassar Avenue	U*	F	391	2087	F	487	2585
9	Clinton Avenue and SR-99 SB Ramps	Does not Exist						
10	Clinton Avenue and SR-99 NB Ramps	S	A	10	2244	B	13	3141
11	***Clinton Avenue and Weber Avenue***	***S***	***D***	***36***	***2117***	***E***	***64***	***2835***
12	Princeton Avenue and SR-99 SB Ramp/Parkway Drive	U*	A	9	98	A	9	79
13	Shields Avenue and SR-99 SB Ramp/Parkway Drive	U	B	14	1013	C	22	1088
14	Shields Avenue and Valentine Avenue	U	B	12	699	B	12	813
15	Shields Avenue and Brawley Ave	U	A	9	630	B	13	1028
16	Dakota Avenue and Brawley Avenue	U	B	14	848	C	16	950
18	Ashlan Avenue and SR-99 SB Ramp/Parkway Drive	S	D	38	2108	D	49	2827
19	***Ashlan Avenue and SR-99 NB Ramp/Brawley Avenue***	***S***	***C***	***32***	***2857***	***E***	***56***	***3936***
20	Brawley Avenue and Golden State Boulevard	U*	F	81	1358	F	123	1456
21	Golden State Boulevard and Shaw Avenue	S	C	25	2719	D	46	3961

U = Unsignalized, S = Signalized

Intersections selected for analysis are italicized

E.5-4 SR-99 Realignment Area

Intersection Control, LOS, Average Delay, and Total Volume Su

#	Intersection	2008 Existing Plus Project						
			AM Peak Hour			PM Peak Hour		
		Control	LOS	Delay (sec)	Volume (veh)	LOS	Delay (sec)	Volume (veh)
1	McKinley Avenue and Woodson Avenue	U*	B	11	568	B	13	729
2	McKinley Avenue and SR-99 SB Ramp	U*	A	9	1011	A	9	940
3	McKinley Avenue and SR-99 NB Ramp	U*	C	16	986	C	16	1033
4	McKinley Avenue and Motel Drive	S	B	16	1201	B	15	1442
5	Clinton Avenue and Brawley Avenue	S	B	20	1443	C	24	1889
6	Clinton Avenue and Marks Avenue	S	D	41	2316	D	43	2814
7	Clinton Avenue and Vassar Avenue	U*	E	42	1975	C	19	2480
9	Clinton Avenue and SR-99 SB Ramps	S	B	15	2394	A	9	2811
10	Clinton Avenue and SR-99 NB Ramps	S	B	17	2320	B	17	3178
11	***Clinton Avenue and Weber Avenue***	***S***	***C***	***33***	***2173***	***E***	***68***	***2857***
12	Princeton Avenue and SR-99 SB Ramp/Parkway Drive	Intersection removed as part of the project improvements						
13	Shields Avenue and SR-99 SB Ramp/Parkway Drive	Intersection removed as part of the project improvements						
14	Shields Avenue and Valentine Avenue	U	A	9	606	B	11	858
15	Shields Avenue and Brawley Ave	U	A	9	640	B	14	1058
16	Dakota Avenue and Brawley Avenue	U	C	16	939	F	53	1197
18	Ashlan Avenue and SR-99 SB Ramp/Parkway Drive	S	D	36	2201	C	34	3073
19	***Ashlan Avenue and SR-99 NB Ramp/Brawley Avenue***	***S***	***C***	***32***	***2857***	***E***	***57***	***3936***
20	Brawley Avenue and Golden State Boulevard	U*	F	81	1358	F	123	1456
21	Golden State Boulevard and Shaw Avenue	S	C	24	2719	D	44	3961

U = Unsignalized, S = Signalized

Intersections selected for analysis are italicized

E.5-4 SR-99 Realignment Area

Intersection Control, LOS, Average Delay, and Total Volume Su

#	Intersection	2008 Existing Plus Project with Mitigation						
			AM Peak Hour			PM Peak Hour		
		Control	LOS	Delay (sec)	Volume (veh)	LOS	Delay (sec)	Volume (veh)
1	McKinley Avenue and Woodson Avenue	U*	B	11	568	B	13	729
2	McKinley Avenue and SR-99 SB Ramp	U*	A	9	1011	A	9	940
3	McKinley Avenue and SR-99 NB Ramp	U*	C	16	986	C	16	1033
4	McKinley Avenue and Motel Drive	S	B	16	1201	B	15	1442
5	Clinton Avenue and Brawley Avenue	S	B	20	1443	C	24	1889
6	Clinton Avenue and Marks Avenue	S	D	41	2316	D	43	2814
7	Clinton Avenue and Vassar Avenue	U*	E	42	1975	C	19	2480
9	Clinton Avenue and SR-99 SB Ramps	S	B	15	2394	A	9	2811
10	Clinton Avenue and SR-99 NB Ramps	S	B	17	2320	B	17	3178
11	***Clinton Avenue and Weber Avenue***	***S***	***C***	***27***	***2173***	***C***	***32***	***2857***
12	Princeton Avenue and SR-99 SB Ramp/Parkway Drive	Intersection removed as part of the project improvements						
13	Shields Avenue and SR-99 SB Ramp/Parkway Drive	Intersection removed as part of the project improvements						
14	Shields Avenue and Valentine Avenue	U	A	9	606	B	11	858
15	Shields Avenue and Brawley Ave	U	A	9	640	B	14	1058
16	Dakota Avenue and Brawley Avenue	S	A	7	939	A	7	1197
18	Ashlan Avenue and SR-99 SB Ramp/Parkway Drive	S	D	36	2201	C	34	3073
19	***Ashlan Avenue and SR-99 NB Ramp/Brawley Avenue***	***S***	***C***	***32***	***2857***	***E***	***57***	***3936***
20	Brawley Avenue and Golden State Boulevard	U*	F	81	1358	F	123	1456
21	Golden State Boulevard and Shaw Avenue	S	C	24	2719	D	44	3961

U = Unsignalized, S = Signalized

Intersections selected for analysis are italicized

APPENDIX F

Potential Air Quality Impacts of Heavy Maintenance Facility Operations

APPENDIX F

POTENTIAL AIR QUALITY IMPACTS OF HEAVY MAINTENANCE FACILITY (HMF) OPERATIONS

Parsons Brinckerhoff

August 2011

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1.0 Introduction

The HST project will include a heavy maintenance facility (HMF) that would service and repair the rail cars and locomotives. The facility would include locomotives, diesel equipment (e.g., cranes, backhoes, loaders, etc.), heavy-duty diesel trucks, and a spray booth for painting the trains. While measures would be incorporated to minimize atmospheric emissions from these sources, such as the use of electric yard trains to move the rail cars and electric locomotives around the site, the use of diesel-retrofits on heavy-duty diesel engines, etc., the activities at the HMF site would generate emissions that could impact nearby sensitive land uses. The major sources of HMF emissions include:

- Switch diesel locomotive activities associated with maintenance of way operations;
- Spray booth painting operations;
- Diesel equipment; and
- Diesel trucks.

While only one HMF will be needed for the HST project, several sites are currently being considered. Some of these may have sensitive land uses located nearby. As no one site has been selected, an air quality analysis was conducted for a prototypical facility (using the current facility design and anticipated activities) to determine whether HMF operations have the potential to significantly impact nearby sensitive land uses.

2.0 Pollutants of Concern

Criteria pollutants (i.e. pollutants for which national ambient air quality standards [NAAQS] have been established), pollutants for which California ambient air quality standards [CAAQS] have been established, and non-criteria toxic air contaminants (TACs) were considered in this analysis of potential localized impacts. The criteria pollutants considered are:

- Nitrogen dioxide (NO_2) from diesel locomotives, diesel equipment, and trucks; and
- Particulate matter smaller than 10 microns (PM_{10}) and particulate matter smaller than 2.5 microns ($PM_{2.5}$) from diesel locomotives, diesel equipment, trucks, and spray booth operations.

The TACs considered are contaminants identified by the California Air Resources Board (CARB) and the California Office of Environmental Health Hazard Assessment (OEHHA) that may be emitted from HMF operations, including diesel engines and spray booth activities. Of these, the most critical pollutant for determining the potential health effects of the HMF operations is diesel particulate matter (diesel PM), which has been identified by CARB as a TAC based on its potential to cause cancer and other adverse health problems, including respiratory illnesses, and increased risk of heart disease. There are also a number of toxic pollutants (with various toxicities) that are either caricnogenic or non-carconogenic that can also be potentially released from spray booth operations and diesel vehicular exhaust.

Analyses were conducted that considered chronic (long-term) carcinogenic, chronic non-carcinogenic, and acute (short-term) health risks. These analyses were conducted following San Joaquin Valley Air Pollution Control District (SJVAPCD) modeling guidance for a diesel “only” facility, which is defined as a facility where diesel PM is the predominant TAC and where emissions of other toxic pollutants will not contribute significantly (i.e., cancer risk greater than 1 in one million) to the overall risk.

3.0 Emission Factors and Rates

Emission factors from the locomotives and diesel-powered engines of the equipment and trucks and spray booth operations were estimated as follows:

- PM_{10}, $PM_{2.5}$, and NO_2 emissions from switch locomotives were estimated assuming these vehicles would comply with EPA Tier 4 emission standards (which are standards also adopted by CARB) applicable for newly manufactured (after 2015) locomotives (73 FR 88 25098-25352, May 6, 2008) that utilize stringent control technologies and use ultra-low sulfur diesel fuel, and locomotive emission rates were estimated based on locomotive type, notch setting, activity time, and duration;
- For other diesel equipment, EPA's Tier 4 emission standards for non-road diesel engines were used (69 FR 38957-39273, 29 June 2004);
- PM_{10} emission factors were used to represent diesel PM;
- Diesel truck emissions were estimated using EMFAC2007, CARB's latest vehicular emission factor algorithm; and
- Volatile organic compounds (VOCs) from paint booth emissions were estimated using conservative volatility rates and paint usage projections assuming that the paint booths would be equipped with conventional filters with 90% control efficiency. Speciation of VOC compounds from these emissions was obtained from *CARB's Organic Speciation Profile for Surface Coating Operations.* Speciation of VOC compounds from diesel combustion emissions was obtained from CARB's *Organic Speciation Profile for Diesel Light & Heavy Equipment*.

Emission rates for the locomotives, diesel equipment, and trucks were estimated based on the following HMF operating scenario, which was supplied by the project's design engineers:

- Two (2) switch locomotives (for maintenance-of-way operations) and six (6) pieces of diesel-fueled equipment would be operating at the HMF;
- Two (2) maintenance-of-way locomotives, which are assumed to be 2,000 horse-power (hp) each, would be idling for 2 hours and moving around the HMF site for 2 hours over a 24-hour period, and the locomotives would go through all notches (gears) when moving (see Table 1 for the hp and load factors used in this analysis);
- The diesel equipment, which is assumed to be 200 hp each, would be operating continuously for 8 hours over a 24-hour period; and
- Twenty (20) diesel trucks would be operating on the site continuously for 8 hours over each 24-hour period.

Tables 2, 3, and 4 present estimated PM_{10}, $PM_{2.5}$, and NO_2 emission rates estimated for locomotives, diesel equipment, and trucks, respectively, together with the parameters and references used to develop these estimates.

Table 1
Switch Locomotive Horse-Power and Load Factors

Notch	HP (1)	% HP in use	Percent Time in Notch (2)	Actual % time in use	Engine HP (3)	Equivalent HP Used in Analysis	Load Factors (4)
Idle	13	0.3%	38%	100%	7	7	0.3%
Dynamic Brake	128	3.4%	12.5%	20.2%	68	14	
1	211	5.6%	6.5%	10.5%	112	12	
2	457	12.1%	6.5%	10.5%	242	25	
3	928	24.6%	5.2%	8.4%	492	41	
4	1,084	28.7%	4.4%	7.1%	575	41	
5	1,666	44.2%	3.8%	6.1%	883	54	
6	2,375	62.9%	3.9%	6.3%	1,259	79	
7	3,182	84.3%	3.0%	4.8%	1,687	82	
8	3,773	100.0%	16.2%	26.1%	2,000	523	
Total for Moving Locomotives			100%	100%		877	44%

Assumptions:

1. Notch horsepower usage was obtained from tests conducted by MotivePower, a Wabtec company, for the MP36PH-3C locomotive.
2. Percent time in each notch is based on EPA-estimated high power duty-cycles for locomotives.
3. Each switch locomotive is assumed to be 2,000 hp.
4. Average load factors were estimated for two operational modes: idling and moving. It is assumed that the engines would go through all notches when moving.

Table 2
PM_{10} Emission Rates for Switch Locomotive and Diesel Equipment

HMF Operations	Mode	Average Number of Locomotives[1] or Pieces of Diesel Equipment	Engine Horsepower (hp) [2]	Load Factor[3] (%)	Tier 4 Emission Factors [4] (g/bhp-hr)	PM_{10} Emission Rates	
						24-hour	Annual
						g/sec	lb/year
Locomotive	Idle	2	2,000	0.3%	0.03	9.57E-06	6.65E-01
	Moving	2	2,000	44%	0.03	1.22E-03	8.47E+01
Diesel Equipment[5,6]	—	6	200	60%	0.015	1. 00E-03	6.95E+01
Diesel Trucks[7,8]	—	20	—	—	0.596 [7]	1.49E-03	1.04E+02
Total	**—**		**—**	**—**	**—**	**4.06E-03**	**2.82E+02**

Assumptions:

1. Number of locomotives operating in yard, duration of operation in each mode, and number of pieces of diesel equipment were provided by the project engineers. It is assumed that each locomotive would be moving and idling continuously for 2 hours over a 24-hour period.

2. The switch locomotive is assumed to be 2,000 hp; the diesel equipment is assumed to be 200 hp.

3. Load factors for locomotives are weighted-average factors that were estimated for idling and moving modes based on in-use power at each notch setting (see Table 1).

4. Locomotives would be purchased after 2015 and, therefore, subject to Tier 4 emission standards (http://dieselnet.com/standards/us/). The emission factors used are the most stringent locomotive Tier 4 federal standards for switch locomotives (73 FR 88 25098-25352, May 6, 2008).

5. PM_{10} emission factors used for diesel for equipment are Tier 4 federal standards for on-road (off-road) diesel engines introduced in May, 2004 (69 FR 38957-39273, 29 June, 2004) and are provided in Table 3, Tier 4 Emission Standards for engines up to 560 KW from an online source: http://dieselnet.com/standards/us/

6. Each piece of diesel equipment was assumed to operate for 8 hours over a 24-hour period; the load factor for this equipment was assumed to be 0.6.

7. Emission factors for the diesel trucks, which are for 2017, were estimated using California's EMFAC2007 model and are in units of grams of PM per vehicle-mile. Values are for running exhaust emissions at 10 mph, and include tire wear and brake wear emissions for diesel trucks.

8. It was assumed that 20 trucks would operate on the site for 8 hours over each 24-hour period.

Table 3
$PM_{2.5}$ Emission Rates for Switch Locomotive and Diesel Equipment

HMF Operations	Mode	Average Number of Locomotives(1) or Pieces of Diesel Equipment	Engine Horsepower (hp) (2)	Load Factor 3) (%)	Tier 4 Emission Factors (4) (g/bhp-hr)	$PM_{2.5}$ Emission Rates	
						24-hour	Annual
						g/sec	lb/year
Locomotive	**Idle**	2	2,000	0.3%	0.03	9.28E-06	6.45E-01
	Moving	2	2,000	44%	0.03	1.18E-03	8.22E+01
Diesel Equipment(5,6)	—	6	200	60%	0.015	9.70E-04	6.74E+01
Diesel Trucks(7,8)	—	20	—	—	0.514 (7)	1.29E-03	8.96E+01
Total	**—**		**—**	**—**	**—**	**3.45E-03**	**2.40E+02**

Assumptions:

1. Number of locomotives operating in yard, duration of operation in each mode, and number of pieces of diesel equipment were provided by the project engineers. It is assumed that each locomotive would be moving and idling continuously for 2 hours over a 24-hour period.

2. The switch locomotive is assumed to be 2,000 hp; the diesel equipment is assumed to be 200 hp.

3. Load factors for locomotives are weighted-average factors that were estimated for the idling and moving modes based on in-use power at each notch setting (see Table 1).

4. Locomotives would be purchased after 2015 and, therefore, subject to Tier 4 emission standards (http://dieselnet.com/standards/us/). The emission factors used are the most stringent locomotive Tier 4 federal standards for switch locomotives (73 FR 88 25098-25352, May 6, 2008). $PM_{2.5}$ emission factors are assumed to be 92 percent of the PM_{10} emission factors.

5. $PM_{2.5}$ emission factors used for diesel for equipment are Tier 4 federal standards for on-road (off-road) diesel engines introduced in May, 2004 (69 FR 38957-39273, 29 June, 2004) and are provided in Table 3, Tier 4 Emission Standards for engines up to 560 KW from an online source: http://dieselnet.com/standards/us/

6. Each piece of diesel equipment was assumed to operate for 8 hours over a 24-hour period; the load factor for this equipment was assumed to be 0.6.

7. Emission factors for the diesel trucks, which are for 2017, were estimated using California's EMFAC2007 model and are in units of grams of PM per vehicle-mile. Values are for running exhaust emissions at 10 mph, and include tire wear and brake wear emissions for diesel trucks.

8. It was assumed that 20 trucks would operate on the site for 8 hours over each 24-hour period.

Table 4
NO_2 Emission Rates for Switch Locomotives and Diesel Equipment

HMF Operations	Mode	Average Number of Locomotive (1) or Pieces of Equipment	Engine Horsepower (2) (hp)	Load Factor (3) (%)	Tier 4 Emission Factors (4) (g/bhp-hour)	Annual NO_2 Emission Rates[5]	
						g/sec	lb/year
Locomotive	**Idle**	2	2,000	0.3%	1.3	4.15E-04	2.88E+01
	Moving	2	2,000	44%	1.3	5.28E-02	3.67E+03
Diesel Equipment (6,7)		6	200	60%	0.3	2.00E-02	1.39E+03
Diesel Trucks (8,9)		20			11.03	2.77E-02	1.92E+03
Total						**1.01E-01**	**7.01E+03**

Assumptions:

1. Number of locomotives operating in yard, duration of operation in each mode, and number of pieces of diesel equipment were provided by the project engineers. It is assumed that each locomotive would be moving and idling continuously for 2 hours over a 24-hour period.

2. The switch locomotive is assumed to be 2,000 hp; the diesel equipment is assumed to be 200 hp.

3. Load factors for locomotives are weighted-average factors that were estimated for the idling and moving modes based on in-use power at each notch setting (see Table 1).

4. Locomotives would be purchased after 2015 and, therefore, subject to Tier 4 emission standards (http://dieselnet.com/standards/us/). The emission factors used are the most stringent locomotive Tier 4 federal standards for switch locomotives that were introduced in May 2008 (73 FR 88 25098-25352, May 6, 2008)

5. It is conservatively assumed that all of the nitrogen oxides released from the diesel exhaust would be in the form of NO_2.

6. Emission factors used for diesel for equipment are Tier 4 federal standards for on-road (off-road) diesel engines introduced in May, 2004 (69 FR 38957-39273, 29 June, 2004) and are provided in Table 3, Tier 4 Emission Standards for engines up to 560 kW from an online source. (http://dieselnet.com/standards/us/).

7. Each piece of diesel equipment was assumed to operate for 8 hours over a 24-hour period; the load factor for this equipment was assumed to be 0.6.

8. NOx emission factors for the diesel trucks, which are for 2017, were estimated using California's EMFAC2007 model.

9. It was assumed that 20 trucks would operate on the site for 8 hours over each 24-hour period.

4.0 Dispersion Modeling

As the operation of the HMF has the potential to cause health impacts on nearby sensitive land uses, detailed dispersion modeling analyses were conducted to determine whether these impacts would be significant. USEPA's AERMOD atmospheric dispersion model was used to simulate physical conditions and predict pollutant concentrations at the facility's property line and at specified distances from the boundaries of a prototypical HMF facility.

AERMOD is generally applied to estimate impacts from simple point-source emissions from stacks as well as emissions from volume and area sources. The model accepts actual hourly meteorological observations and directly estimates hourly and average concentrations for various time periods. Regulatory default options and the rural dispersion algorithm of the AERMOD model were conservatvely used in these analyses.

The final site of the HMF has not as yet been selected and there are several potential sites between Merced and Bakersfield that are being considered. As such, site-specific coordinates that include locations of nearby sensitive land uses cannot be considered at this time. Instead, a prototypical site was analyzed (using a conceptual design and anticipated HMF activities), and pollutant concentrations were estimated at the site's property line and distances of approximately 500, 1,000, 1,300, 3,000, and 5,000 feet from the site boundary. Receptors were located around the property boundary in increments of 25 meters, as specified in SJVAPCD modeling guidance. The maximum concentrations found at any location were used to estimate potential impacts, and these values were compared with applicable federal and state air quality standards and health-related guidelines.

Emissions from all operations were simulated as one area source spread out over the 140 acre prototypical HMF site. An emissions release height was assumed to be 4.5 meters (14.8 feet) to approximate the stack heights of the locomotive engines, diesel trucks, and spray booth stack(s). Five years of meteorological data (i.e., 2004 through 2009) from Merced County Airport, as compiled by SJVAPCD, were used for all analyses.

The results of these analyses were used to estimate worst-case pollutant (criteria and TAC) concentrations for:

- Comparison with the NAAQS and CAAQS; and
- Input to the health risk analysis.

5.0 Health Risk Methodology

Maximum estimated dispersion modeling concentrations of diesel PM and other representative TACs were used to calculate cancer risks, chronic noncancer health risks, and acute health risks associated with HMF operations. The following methodologies were applied.

5.1 Cancer Risk

From the multiple pollutants that may be emitted from diesel vehicular exhaust, and spray booth operations, six pollutants, are considered by OEHHA as carcinogens for which cancer potency factors (or unit risk factors) were developed. These are diesel PM, benzene, 1, 3-butadiene, acetaldehyde, formaldehyde, and methylene chloride. The maximum individual cancer risk for each pollutant and total incremental cancer risks associated with these pollutant releases were calculated as described below. The 5-year average AERMOD-estimated concentrations were used for these calculations, as recommended by the SJVAPCD. Metal elements bounded to PM from vehicular exhaust, such as arsenic, cadmium, nickel, and others, were considered as part of the diesel PM.

The cancer risk calculation procedures developed by OEHHA, together with OEHHA/CARB-approved health values for health risk assessments, that were used are based on the following:

- Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor; and
- OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L – Table 1, Cancer Risk, Inhalation Cancer Potency Factors and Chronic Inhalation REL and Acute REL values.

The detailed procedures and equations used in these calculations are as follows:

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where,

C_{air} = concentration in air (ug/m3)

DBR = Daily Breathing Rate (L/kg body weight-day)

A = Inhalation absorption factor

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged

10^{-6} = Conversion Factor

Cancer Risk (per million) = CP x Inhalation Dose x 1.0E+06 = URF x C_{air}

Where,

CP = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

URF = Unit risk factor (cancer risk per ug/m3)

The following are detailed descriptions of some of the parameters used in the health risk assessment:

5.1.1 Daily Breathing Rate (DBR)

Exposure to airborne chemicals occurs through inhalation and subsequent absorption into the body, potentially resulting in adverse health effects depending on toxicological properties of the chemical and concentration in air. The dose of a substance through inhalation is a function of the concentration of the substance and the amount of air inhaled. DBR values used in these procedures, expressed in liters per kilogram-day (L/kg-day), as recommended by SJVAPCD for diesel PM, is 393 L/kg body weight-day. This DBR value was also used for calculations of the cancer risk of other carcinogenic pollutants.

5.1.2 Cancer Potency Factor (CP)

The inhalation cancer potency factor is a measure of the cancer potency of a carcinogen. It is the estimated probability that a person will contract cancer as a result of inhalation of a concentration of 1 milligram of the TAC per kilogram of body weight continuously over a period of 70 years. The inhalation cancer potency factors used in this analysis (see Tables 8-13) were obtained from OEHHA.

5.1.3 Exposure Value Factors

In order to protect public health, and in accordance with the recommendations of OEHHA, a 70-year lifetime exposure is assumed for all receptor locations. In addition to the 70-year exposure duration (ED) values, exposure values used to calculate cancer risk are exposure frequency (EF), which is the number of days per year of exposure, and the averaging time period in days over which exposure is averaged (AT). For EF, OEHHA and SJVAPCD recommend the use of 350 days/year for residential exposure. For AT, OEHHA and SJVAPCD recommend the use of 25,550 days (70 years x 365 days/year). For ED values used to calculate chronic noncancer risk, EPA recommends the use of 30 years.

5.2 Chronic Noncancer Risk

Calculations for estimating the chronic noncancer hazard index (HQ) are based on the EPA's Human Health Risk Assessment Protocol (HHRAP, Appendix C, Tables C-2-1 and C-2-2) methodology and equations, as follows:

HQ = EC x 0.001/RfC

Where,

EC = Ca x EF x ED/AT x 365 days/year or EC = Ca x Fc, where

HQ = hazard quotient for direct inhalation of noncarcinogen (unitless)

Ca = annual concentration estimated by the AERMOD, ug/m3

EC = exposure concentration, ug/m3

EF = exposure frequency, days/year, assumed by EPA to be equal 350 days/year

ED = exposure duration is assumed to be 70 years

AT = averaging time, years; AT is assumed by EPA to be equal 30 years

RfC = reference concentration for chronic inhalation exposure, mg/m3 (EPA Integrated Risk Information System (IRIS)

0.001=units conversion factor, mg/ug

5.3 Acute Hazard Risk

Acute hazard index analyses are based on HHRAP methodology and equations (HHRAP, Appendix C, Table C-4-1 and B, Table B-6-1), as follows:

AHQ = C_{acute} x 0.001/AIEC

Where,

AHQ acute hazard quotient, unitless

C_{acute}=1-hr estimated concentration, ug/m3

AIEC = acute inhalation exposure criteria, mg/m3. They were obtained from EPA Table 2 "Acute Dose-Response Values for Screening Risk Assessments

0.001= units conversion factor, mg/ug

REL are OEHHA/ARB approved health values for use in Hot Spot facility Risk Assessment, Acute Reference Exposure Levels and target Organs. Appendix L-Table 2

Diesel PM has no acute health value; therefore, it was not included in acute hazard index calculations.

6.0 Results

6.1 Criteria Pollutants

Total estimated concentrations of the criteria pollutants at the HMF property line are provided in Table 5. In general, HMF emissions of criteria pollutants would not cause an exceedance of a NAAQS or CAAQS at the facility's property line. However, because ambient values currently being monitored at the Merced, Madera, Drummond, and/or Fresno monitoring stations currently exceed the 24-hour and annual PM2.5 NAAQS and the 24-hour and annual PM10 CAAQS, and may continue to exceed these standards under future No Build conditions, there is a potential that HMF emissions could exacerbate future exceedances even though the maximum estimated project impacts at the property line are minimal.

Table 5
Total Estimated Concentrations of the Criteria Pollutants at the Property Line

Pollutant	Time Period	CAAQS (ug/m3)	NAAQS (ug/m3)	Estimated Impacts (ug/m3)	Background Conc. (ug/m3)	Total Estimated Concentrations (ug/m3)	Exceed CAAQS ?	Exceed NAAQS ?
NO_2	1-hour	339	188	25.2	81.8	106.9	No	No
	Annual	57	100	2.3	30.1	32.4	No	No
PM_{10}	24-hr	50	150	0.44	99.5	99.9	Yes	No
	Annual	20	—	0.15	40.5	40.7	Yes	—
$PM_{2.5}$	24-hr	—	35	0.25	81.6	81.8	—	Yes
	Annual	12	15	0.08	15.23	15.3	Yes	Yes

6.2 Toxic Pollutants

6.2.1 Chronic Noncancer Risk

The results of hazard chronic noncancer index calculations are summarized in Table 6. Pollutants listed are those for which non-cancer RfC (reference dose concentration) guideline values are available from EPA's Integrated Risk Information System (IRIS), Prioritized Chronic Dose-Response Values for Screening Risk Assessments (EPA, Table 1, June 2007) and REL (Reference Exposure Limit) values from OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments.

As shown, the total maximum chronic noncancer hazard index at the HMF property line is estimated to be less than 1 – using both EPA and OEHHA health risk values. As such, potential chronic noncancer risks associated with HMF operations are not considered to be significant.

6.2.2 Acute Risk

The results of acute hazard index calculations are summarized in Table 7. Pollutants listed are those for which acute inhalation exposure criteria values are available from the Prioritized Chronic Dose-Response Values for Screening Risk Assessments (EPA, Table 1, June 2007) and acute REL values from OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments.

As shown, the total maximum acute hazard index at the HMF property line are estimated to be less than 1 – using both EPA and OEHHA health risk values. As such, potential acute health risks associated with HMF operations are not considered to be significant.

6.2.3 Cancer Risks

Maximum cancer risks were estimated at various distances from the HMF boundary until impacts were not considered to be significant. Based on the results of these preliminary analyses, it was determined that at a distance of approximately 1,300 feet from the facility boundary, the overall incremental cancer impacts would be below applicable significant thresholds.

Based on this result, maximum cancer risks at 1,300 feet from the HMF boundary were then computed using procedures recommended by SJVAPCD and OEHHA, which assume continuous exposure over a 70-year life-time for residences. This resulted in a diesel PM unit risk factor of 414.5 for 70-years residential exposure, as determined by the SJVAPCD guidance. This factor was then multiplied by the estimated average diesel PM concentration at 1,300 feet to arrive at an increased cancer risk of approximately 9.7 per million. The same calculations were then performed for each of the other applicable carcinogenic pollutants at a distance of 1,300 feet from the facility boundary (Table 10).

As shown, the total incremental cancer risk due to all these pollutant releases at 1,300 feet from the HMF property does not exceed (i.e., are within) the 10 in a million (10×10^{-6}) significance threshold. As such, the estimated cancer risk at distances greater than 1,300 feet from the HMF boundary is not considered to be significant.

7.0 Conclusions

The results of the air quallity analyses for a prototypical HMF facility are as follows:

1. Criteria pollutant impacts at the HMF property line are not considered to be significant. However, there could be minimal criteria pollutant impacts in areas that would exceed a NAAQS or CAAQS under future No Build conditions. Therefore, prior to the issuance of the final EIS for the HST project, a more detailed analysis, using an actual facility design, actual nearby sensitive land uses, and a more detailed consideration of future background values near the selected site, will be conducted. More stringent emission reduction strategies may also be considered;
2. The total chronic noncancer hazard index at the HMF propery line is less than the threshold value of 1 and, therefore, is not considered to be significant;
3. The total acute hazard index at the HMF propery line is less than the threshold value of 1 and, therefore, is not considered to be significant; and
4. Total incremental cancer risk found at the distance of 1,300 feet from the HMF boundary is less than 10 per million and, therefore, is not considered to be significant. However, until detailed analyses are conducted for an actual (as opposed to a prototypical) HMF facility, the potential cancer risks at sensitive land uses that are located closer than 1,300 feet from the HMF boundary are considered to be significant.

Table 6
Chronic Non-Cancer Hazard Index at the HMF Property Line

Contaminant	CAS No.	Annual Conc. (C_a) ug/m^3	Exposure Conc. (EC) ug/m^3	Reference Dose Conc. (RfC) mg/m^3	OEHHA Chronic Inhalation Exposure (REL) mg/m^3	Hazard Quotients (HQ) based on EPA RfC	Hazard Quotients (HQ) based on OEHHA REL
Ethyl benzene	100-41-4	1.33E-02	1.33E-02	2.0E+00	2.0E+00	1.33E-05	5.00E-04
1,3-butadiene	106-99-0	5.80E-05	5.80E-05	2.0E-02	2.0E-02	2.90E-05	1.00E-04
Formaldehyde	50-00-0	4.49E-03	4.49E-03	3.0E-03	3.0E-03	4.58E-04	3.27E-03
Naphthalene	91-20-3	2.60E-05	2.60E-05			8.65E-06	
Acetaldehyde	75-07-0	2.25E-03	2.25E-03	9.0E-03	9.0E-03	2.49E-04	1.00E-03
Xylene	1330-20-7	1.26E-03	1.26E-03	7.0E-01	7.0E-01	1.26E-05	1.43E-04
Ethylene dibromide	106-93-4	9.48E-04	9.48E-04	8.0E-04	8.0E-04	1.05E-04	1.13E-02
Ethylene glycol	107-21-1	6.32E-04	6.32E-04	4.0E-01	4.0E-01	1.58E-06	1.00E-03
Toluene	108-88-3	2.12E-01	2.12E-01	3.0E-01	3.0E-01	4.25E-05	1.67E-02
n-hexane	110-54-3	1.30E-02	1.30E-02	7.0E+00	7.0E+00	1.85E-05	1.00E-04
Methanol	67-56-1	1.05E-01	1.05E-01	4.0E+00	4.0E+00	2.63E-05	1.00E-03
Dimethyl formamide	68-12-2	1.05E-01	1.05E-01	8.0E-02	8.0E-02	3.51E-03	3.75E-04
Benzene	71-43-2	1.58E-03	1.58E-03	6.0E-02	6.0E-02	5.27E-05	5.00E-04
Ethyl chloride	75-00-3	6.32E-04	6.32E-04	3.0E+01	3.0E+01	6.32E-08	3.33E-04
Methylene chloride	75-09-2	6.95E-03	6.95E-03	4.0E-01	4.0E-01	6.95E-06	2.50E-03
Methyl ethyl ketone	78-93-3	1.74E-01	1.74E-01	5.0E+00		3.48E-05	
Phthalic anhydride	85-44-9	9.48E-04	9.48E-04	2.0E-02	2.0E-02	4.74E-05	1.00E-03
Diesel PM	9901	8.57E-02	8.57E-02	5.0E-03	5.0E-03	1.71E-02	1.00E-03
Total Hazard Index						**2.18E-02**	**4.07E-02**
Hazard Index Threshold						**1**	**1**

Table 7
Total Acute Hazard Index at the HMF Property Line

Contaminant	CAS No.	1-hr Estimated Conc. (C_{acute}) (ug/m^3)	EPA Acute Inhalation Exposure Criteria (AIEC) mg/m^3	OEHHA Acute Inhalation Exposure Criteria (Acute REL) mg/m^3	Hazard Quotients (AHQ) Based on AIEC	Acute Hazard Quotients Based on Acute REL
ethyl benzene	100-41-4	0.15759	3.5E+02		4.50E-04	
1,3-butadiene	106-99-0	0.00068	1.5E+03		4.56E-07	
formaldehyde	50-00-0	0.05297	1.1E+00	9.40E-02	4.82E-02	5.64E-01
naphthalene	91-20-3	0.00031	1.3E+02		2.35E-06	
acetaldehyde	75-07-0	0.02647	8.1E+01		3.27E-04	
xylene	106-42-3	0.01525	2.2E+01	2.20E+01	6.93E-04	6.93E-04
ethylene dibromide	106-93-4	0.01118	1.3E+02		8.60E-05	
ethylene glycol	107-21-1	0.00745	1.3E+00		5.73E-03	
toluene	108-88-3	2.50917	3.7E+01	3.70E+01	6.78E-02	6.78E-02
n-hexane	110-54-3	0.15333	1.2E+04		1.28E-05	
methanol	67-56-1	1.24086	2.8E+01	2.80E+01	4.43E-02	4.43E-02
dimethyl formamide	68-12-2	1.24076	2.7E+02		4.60E-03	
benzene	71-43-2	0.02583	1.3E+00	1.30E+00	1.99E-02	1.99E-02
ethyl chloride	75-00-3	0.00745	4.0E+01		1.86E-04	
methylene chloride	75-09-2	0.08197	1.4E+01	1.40E+01	5.86E-03	5.86E-03
methyl ethyl ketone (mek)	78-93-3	2.05461	1.3E+01	1.30E+01	1.58E-01	1.58E-01
phthalic anhydride	85-44-9	0.01118	6.0E+00		1.86E-03	
Total Estimated Acute Hazard Index					**3.58E-01**	**8.60E-01**
Hazard Index threshold					**1**	**1**

Table 8
Diesel PM and TAC Cancer Risk Calculations at the distance of 500 feet from HMF Boundary

Inhalation Dose Factors [1]

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

Unit Risk Factor Calculations [1, 2]

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations [1, 2]

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.04262	17.66859
Benzene	0.00079	0.02962
Acetaldehyde	0.00112	0.00421
1,3-Butadiene	0.00003	0.00652
Formaldehyde	0.00223	0.01769
Methylene Chloride	0.00346	0.00456
Total Incremental Cancer Risk		**17.7312**
Significance Threshold		**10**

Notes:

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors.

Table 9
Diesel PM and TAC Cancer Risk Calculations at the distance of 1,000 feet from HMF Boundary

Inhalation Dose Factors [1]

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

Unit Risk Factor Calculations [1, 2]

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations [1, 2]

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.02858	11.84592
Benzene	0.00053	0.01986
Acetaldehyde	0.00075	0.00282
1,3-Butadiene	0.00002	0.00437
Formaldehyde	0.00150	0.01186
Methylene Chloride	0.00232	0.00306
Total Incremental Cancer Risk		**11.8879**
Significance Threshold		**10**

Notes:

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors.

Table 10
Diesel PM and TAC Cancer Risk Calculations at the distance of 1,300 feet from HMF Boundary

Inhalation Dose Factors [1]

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

Unit Risk Factor Calculations [1, 2]

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations [1, 2]

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.02334	9.67366
Benzene	0.00043	0.01622
Acetaldehyde	0.00061	0.00230
1,3-Butadiene	0.00002	0.00357
Formaldehyde	0.00122	0.00968
Methylene Chloride	0.00189	0.00250
Total Incremental Cancer Risk		**9.7079**
Significance Threshold		**10**

Notes:

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors.

Table 11
Diesel PM and TAC Cancer Risk Calculations at the distance of 2,000 feet from HMF Boundary

Inhalation Dose Factors [1]

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

Unit Risk Factor Calculations [1, 2]

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations [1, 2]

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.01640	6.79665
Benzene	0.00030	0.01139
Acetaldehyde	0.00043	0.00162
1,3-Butadiene	0.00001	0.00251
Formaldehyde	0.00086	0.00680
Methylene Chloride	0.00133	0.00175
Total Incremental Cancer Risk		**6.8207**
Significance Threshold		**10**

Notes:

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors.

Table 12
Diesel PM and TAC Cancer Risk Calculations at the distance of 3,000 feet from HMF Boundary

Inhalation Dose Factors [1]

	Value					
	DBR	A	Exposure	EF	ED	AT
Exposure Type	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

Unit Risk Factor Calculations [1, 2]

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations [1, 2]

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.01121	4.64486
Benzene	0.00021	0.00779
Acetaldehyde	0.00029	0.00111
1,3-Butadiene	0.00001	0.00172
Formaldehyde	0.00059	0.00465
Methylene Chloride	0.00091	0.00120
Total Incremental Cancer Risk		**4.6613**
Significance Threshold		**10**

Notes:

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors.

Table 13
Diesel PM and TAC Cancer Risk Calculations at the distance of 5,000 feet from HMF Boundary

Inhalation Dose Factors [1]

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

Unit Risk Factor Calculations [1, 2]

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations [1, 2]

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.00636	2.63653
Benzene	0.00012	0.00442
Acetaldehyde	0.00017	0.00063
1,3-Butadiene	0.00000	0.00097
Formaldehyde	0.00033	0.00264
Methylene Chloride	0.00052	0.00068
Total Incremental Cancer Risk		**2.6459**
Significance Threshold		**10**

Notes:

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors.

Cumulative Cancer Risk Values at Different Distances from HMF Boundary

	500 ft		1,000 ft		1,300 ft		2,000 ft		3,000 ft		5,000 ft	
Pollutant	**Estimated Conc.**	**Cancer Risk**	**Estimated Conc.**	**Cancer Risk**	**Estimated Conc.**	**Cancer Risk**	**Estimated Conc.**	**Cancer Risk**	**Estimated Conc.**	**Cancer Risk**	**Estimated Conc.**	**Cancer Risk**
	(ug/m^3)	**per million**	**(ug/m^3)**	**per million**	**(ug/m^3)**	**per million**	**(ug/m^3)**	**per million**	**(ug/m^3)**	**per million**	**(ug/m^3)**	**per million**
Diesel PM	0.04462	**18.496**	0.02989	**12.392**	0.02334	**9.674**	0.01686	**6.990**	0.01136	**4.711**	0.00643	**2.668**
Benzene	0.00082	**0.031**	0.00055	**0.021**	0.00043	**0.016**	0.00031	**0.012**	0.00021	**0.008**	0.00012	**0.004**
Acetaldehyde	0.00117	**0.004**	0.00078	**0.003**	0.00061	**0.002**	0.00044	**0.002**	0.00030	**0.001**	0.00017	**0.001**
1,3-Butadiene	0.00003	**0.007**	0.00002	**0.005**	0.00002	**0.004**	0.00001	**0.003**	0.00001	**0.002**	0.000004	**0.001**
Formaldehyde	0.00234	**0.019**	0.00157	**0.012**	0.00122	**0.010**	0.00088	**0.007**	0.00060	**0.005**	0.00034	**0.003**
Methylene Chloride	0.00362	**0.005**	0.00243	**0.003**	0.00189	**0.002**	0.00137	**0.002**	0.00092	**0.001**	0.00052	**0.001**
Total Incremental Cancer Risk		**18.6**		**12.4**		**9.7**		**7.0**		**4.7**		**2.7**

Cumulative Cancer Risk at 500 feet From HMF Property Line

Inhalation Dose Factors

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

Cancer Potency and Unit Risk Factor Calculations (1,2)

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations

Inhalation Dose $= C_{air} \times DBR \times A \times EF \times ED \times 10^{-6}/AT$

where

C_{air} = concentration in air (ug/m3)

A = Inhalation absorption factor

ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged

10^{-6} = Conversion Factor

Cancer Risk Calculation (1,2)

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.0426228	**17.669**
Benzene	0.0007860	**0.030**
Acetaldehyde	0.0011168	**0.004**
1,3-Butadiene	0.0000289	**0.007**
Formaldehyde	0.0022347	**0.018**
Methylene Chloride	0.0034582	**0.005**
Total Incremental Cancer Risk		**17.7**

Cancer Risk (per million) = CP x Inhalation Dose x 1.0E+06 = URF x C_{air}

where

CP = Cancer potency factor (mg/kg-day)$^{-1}$

URF = Unit risk factor (cancer risk per ug/m3)

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors

Cumulative Cancer Risk at 1,000 feet From HMF Property Line

Inhalation Dose Factors

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

Cancer Potency and Unit Risk Factor Calculations (1,2)

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations

Inhalation Dose $= C_{air} \times DBR \times A \times EF \times ED \times 10^{-6}/AT$

where

C_{air} = concentration in air (ug/m3)

A = Inhalation absorption factor

ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged

10^{-6} = Conversion Factor

Cancer Risk Calculation (1,2)

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.0285765	**11.846**
Benzene	0.0005269	**0.020**
Acetaldehyde	0.0007487	**0.003**
1,3-Butadiene	0.0000193	**0.004**
Formaldehyde	0.0014983	**0.012**
Methylene Chloride	0.0023185	**0.003**
Total Incremental Cancer Risk		**11.9**

Cancer Risk (per million) = CP x Inhalation Dose x 1.0E+06 = URF x C_{air}

where

CP = Cancer potency factor (mg/kg-day)$^{-1}$

URF = Unit risk factor (cancer risk per ug/m3)

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors

Cumulative Cancer Risk at 1,300 feet From HMF Property Line

Inhalation Dose Factors

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

Cancer Potency and Unit Risk Factor Calculations (1,2)

Pollutant	CP (mg/kg-day)$^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6}/AT

where

C_{air} = concentration in air (ug/m3)

A = Inhalation absorption factor

ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged

10^{-6} = Conversion Factor

Cancer Risk Calculation (1,2)

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.02334	**9.674**
Benzene	0.00043	**0.016**
Acetaldehyde	0.00061	**0.002**
1,3-Butadiene	0.00002	**0.004**
Formaldehyde	0.00122	**0.010**
Methylene Chloride	0.00189	**0.002**
Total Incremental Cancer Risk		**9.7**

Cancer Risk (per million) = CP x Inhalation Dose x 1.0E+06 = URF x C_{air}

where

CP = Cancer potency factor (mg/kg-day)$^{-1}$

URF = Unit risk factor (cancer risk per ug/m3)

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors

Cumulative Cancer Risk at 2,000 feet From HMF Property Line

Inhalation Dose Factors

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

Cancer Potency and Unit Risk Factor Calculations (1,2)

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations

Inhalation Dose $= C_{air} \times DBR \times A \times EF \times ED \times 10^{-6}/AT$

where

C_{air} = concentration in air (ug/m3)

A = Inhalation absorption factor

ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged

10^{-6} = Conversion Factor

Cancer Risk Calculation (1,2)

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.0163959	**6.797**
Benzene	0.0003023	**0.011**
Acetaldehyde	0.0004296	**0.002**
1,3-Butadiene	0.0000111	**0.003**
Formaldehyde	0.0008596	**0.007**
Methylene Chloride	0.0013303	**0.002**
Total Incremental Cancer Risk		**6.8**

Cancer Risk (per million) = CP x Inhalation Dose x 1.0E+06 = URF x C_{air}

where

CP = Cancer potency factor (mg/kg-day)$^{-1}$

URF = Unit risk factor (cancer risk per ug/m3)

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors

Cumulative Cancer Risk at 3,000 feet From HMF Property Line

Inhalation Dose Factors

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

Cancer Potency and Unit Risk Factor Calculations (1,2)

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6}/AT

where

C_{air} = concentration in air (ug/m3)

A = Inhalation absorption factor

ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged

10^{-6} = Conversion Factor

Cancer Risk Calculation (1,2)

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.0112050	**4.645**
Benzene	0.0002066	**0.008**
Acetaldehyde	0.0002936	**0.001**
1,3-Butadiene	0.0000076	**0.002**
Formaldehyde	0.0005875	**0.005**
Methylene Chloride	0.0009091	**0.001**
Total Incremental Cancer Risk		**4.7**

Cancer Risk (per million) = CP x Inhalation Dose x 1.0E+06 = URF x C_{air}

where

CP = Cancer potency factor (mg/kg-day)$^{-1}$

URF = Unit risk factor (cancer risk per ug/m3)

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors

Cumulative Cancer Risk at 5,000 feet From HMF Property Line

Inhalation Dose Factors

Exposure Type	Value					
	DBR	A	Exposure	EF	ED	AT
	L/kg BW-day		hours/day	days/year	years	days
Residential (70-years)	393	1	24	350	70	25,550

1. Guidance for Air Dispersion Modeling, San Joaquin Valley Air Pollution Control District, Section 2.7 Alternative Modeling Procedures, Diesel "Only" Facilities, Page 81, Calculation of the Diesel PM Adjustment Factor

Cancer Potency and Unit Risk Factor Calculations (1,2)

Pollutant	CP (mg/kg-day) $^{-1}$	URF (Risk/million/ug/m^3)
Diesel PM	1.10E+00	414.5
Benzene	1.00E-01	37.7
Acetaldehyde	1.00E-02	3.8
1,3-Butadiene	6.00E-01	226.1
Formaldehyde	2.10E-02	7.9
Methylene Chloride	3.50E-03	1.3

Cancer Risk Calculations

Inhalation Dose $= C_{air} \times DBR \times A \times EF \times ED \times 10^{-6}/AT$

where

C_{air} = concentration in air (ug/m3)

A = Inhalation absorption factor

ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged

10^{-6} = Conversion Factor

Cancer Risk Calculation (1,2)

Pollutant	Estimated Conc. (ug/m^3)	Cancer Risk per million
Diesel PM	0.0063602	**2.637**
Benzene	0.0001173	**0.004**
Acetaldehyde	0.0001666	**0.001**
1,3-Butadiene	0.0000043	**0.001**
Formaldehyde	0.0003335	**0.003**
Methylene Chloride	0.0005160	**0.001**
Total Incremental Cancer Risk		**2.6**

Cancer Risk (per million) = CP x Inhalation Dose x 1.0E+06 = URF x C_{air}

where

CP = Cancer potency factor (mg/kg-day)$^{-1}$

URF = Unit risk factor (cancer risk per ug/m3)

2. OEHHA Air Toxics Hot Spots Program Risk Assessment Guidelines, OEHHA, 2003, OEHHA/ARB Approved Health Values for Use in Hot Spot Facility Risk Assessments, Appendix L - Table 1, Cancer Risk, Inhalation Cancer Potency Factors

APPENDIX G

Comparison of RCM and URBEMIS Model Features Memorandum

URS/HMM/Arup Joint Venture
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MEMORANDUM

To: **Ann Koby/PMT; Bryan Porter/PMT**
From: **Tim Rimpo /URS/HMM/Arup; Avanti Tamhane /URS/HMM/Arup**
Date: **7/13/2011**
Subject: **Comparison of RCM and URBEMIS model features**

This memo compares two air quality software tools for their effectiveness in estimating emissions generated by large scale linear construction projects such as the High Speed Train (HST). These tools include URBEMIS2007 and the Road Construction Model (RCM). URBEMIS2007 was developed to quantify emissions from land use projects, whereas RCM was designed for road and bridge construction projects.

Given that RCM was designed specifically to estimate linear project emissions, it would seem to be the most appropriate model for HST. However, URBEMIS2007 has several advantages over RCM in estimating emissions from large linear construction projects.

Construction Exhaust Emission Factors

Construction exhaust emissions are generated by on-road and off-road vehicles. Both RCM and URBEMIS2007 use the California Air Board's (CARB) OFFROAD2007 model to estimate emissions for off-road construction equipment and CARB's EMFAC2007 model to estimate on-road vehicle emissions.

One key difference between the models is that RCM uses OFFROAD2007 emission factors specific to Sacramento County[1], whereas URBEMIS2007 uses statewide average OFFROAD2007 emission factors[2]. Neither RCM nor URBEMIS' emission factors can be over-written with SJVAPCD-specific OFFROAD2007 factors.

For estimating on-road emissions, RCM uses Sacramento County specific EMFAC2007 emission factors for light duty trucks and heavy-heavy duty vehicles based on an average vehicle speed of 30 mph. In contrast, URBEMIS2007 uses EMFAC emission factors for the geographic area selected by the user (e.g., county or air district). This model also uses county or air basin specific speeds to estimate on-road emissions.

[1] RCM was developed by the Sacramento Metropolitan Air Quality Management District.
[2] Development of URBEMIS2007 was funded by several California Air Districts.

Fugitive Dust Assumptions

Both RCM and URBEMIS2007 estimate fugitive dust emissions by multiplying the acreage actively disturbed per day by an emission factor. The acreage actively disturbed per day is generated by RCM and URBEMIS2007 based on project information. The disturbed acreage estimates can be overridden by the user. Both models use an identical fugitive dust emission factor as specified by CARB[3]. RCM does not allow the dust emission factor to be overridden, whereas URBEMIS does allow that factor to be modified by the user.

Phasing

One similarity between the two models is they assume that equipment specified for each construction phase will operate continuously throughout the phase. However, this is where the similarities end. RCM only allows the user to estimate emissions for four phases - grubbing/land clearing, grading/excavation, draining, and paving - and those phases cannot overlap. URBEMIS2007 is much more flexible in this regard. It includes seven distinct phases and allows those phases to overlap. Plus, it allows the user to specify as many additional phases as are needed. For example, if the user knows that grading will consist of two separate sets of activities, they can set up URBEMIS2007 to estimate emissions for two grading phases. Because RCM does not allow this, URBEMIS2007 is a much more flexible tool for evaluating large projects with multiple phases.

Reporting

Another advantage of URBEMIS is that it reports emissions in tons per year, which allows for easy comparison to annual significance thresholds. In contrast, RCM reports emissions as tons over the entire construction project instead of tons per year, making it difficult to compare emissions to a tons-per-year threshold.

Equipment Lists

To estimate construction emissions, both RCM and URBEMIS2007 require that an equipment list be specified for each active construction phase. Table 1 shows a typical equipment list. Both models require that the user enter basic project description information. Both models then use that information to generate phasing assumptions and a default equipment list for each phase.

Phasing and default equipment lists generated by each model are based on a construction database of similar projects. URBEMIS2007 generates default phasing and equipment lists for land use projects and RCM generates default phasing and equipment lists for road construction projects. These estimates are reasonably accurate for small projects of the same type. However, the defaults are only approximations and project specific phasing and equipment should be used

[3] Under contract to the South Coast Air Quality Management District, the Midwest Research Institute derived a value of 0.11 tons fugitive PM10 dust per acre per month from construction activities, which converts to 10 pounds per day, assuming 22 workdays per month. The California Air Resources Board has reviewed this factor and concluded that it represents PM10 emissions with watering. Consequently, ARB concludes that 20 pounds per acre day is more appropriate for unmitigated fugitive dust conditions (http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf).

when available. Also, when using URBEMIS2007 to estimate emissions for a linear project, the default construction equipment list should never be used. Instead, the user should override the default equipment list with project specific equipment estimates. Also, for large projects like HST, the user should always override the default phasing and equipment specified by the model with project specific phasing, construction equipment and, if available, equipment horsepower.

Examples for Using Project Specific Construction Lists

To ensure that construction emissions are not underestimated, it is important to use project-specific equipment lists as opposed to the default lists in URBEMIS2007. For both the Merced to Fresno (MF) and Fresno to Bakersfield (FB) alignments, the URBEMIS2007 default construction phasing and equipment lists were over-written using data provided by the project engineers for guideway/alignment construction. The project specific lists contained information about the equipment type, number in use, horsepower, and hours of operations. The default load factors from URBEMIS2007 for each equipment type were used, since the project engineers were unable to provide this value.

For example, earth moving activities associated with HST construction take place over two years from August 2013 to August 2015. Table 1 shows the default equipment list that URBEMIS2007 generates for these earth moving activities.

Table 1 – URBEMIS Default Equipment List for Earth Moving

Equipment	HP	Total Pieces	Load Factor	Hours/Day
Fine Grading/ Mass Grading				
Graders	174	2	0.61	8
Rubber Tired Dozers	357	2	0.59	8
Water Trucks	189	2	0.5	8
Tractors/Loaders/Backhoes	108	4	0.55	7
Trenching				
Excavators	168	2	0.57	8
Other General Industrial Equipment	238	1	0.51	8
Tractors/Loaders/Backhoes	108	1	0.55	0

Alternatively, Table 2 shows the more comprehensive equipment list provided by the HST project engineers for these earth moving activities.

Table 2 – Project Specific Equipment List for Earth Moving

Equipment	HP	Total Pieces	Load Factor	Hours/Day
Fine Grading/ Mass Grading/ Trenching				
Concrete/Industrial Saws	120	15	0.65	8
Excavators	300	12	0.65	8
Excavators	450	12	0.65	8
Graders	158	15	0.65	8
Graders	260	15	0.65	8
Off Highway Trucks	175	30	0.65	8
Off Highway Trucks	210	30	0.65	8
Off Highway Trucks	385	6	0.65	8
Off Highway Trucks	200	30	0.65	8
Off Highway Trucks	150	30	0.65	8
Off Highway Trucks	300	30	0.65	8
Other Equipment	15	15	0.65	8
Other Equipment	10	120	0.65	8
Rollers	83	15	0.65	8
Rollers	156	15	0.65	8
Rollers	174	15	0.65	8
Rubber Tired Dozers	125	15	0.65	8
Rubber Tired Dozers	310	15	0.65	8
Rubber Tired Dozers	410	15	0.65	8
Rubber Tired Dozers	850	6	0.65	8
Rubber Tired Loaders	149	15	0.65	8
Rubber Tired Loaders	197	15	0.65	8
Rubber Tired Loaders	262	15	0.65	8
Rubber Tired Loaders	349	15	0.65	8
Surfacing Equipment	266	30	0.65	8
Surfacing Equipment	335	30	0.65	8
Surfacing Equipment	400	30	0.65	8
Tractors/Loaders/Backhoes	87	15	0.65	8
Tractors/Loaders/Backhoes	97	15	0.65	8
Trenchers	40	6	0.65	8
Water Trucks	210	30	0.65	8

Conclusions

The URBEMIS2007 model can be used to estimate emissions for linear construction projects if project specific construction phasing and equipment is known. The URBEMIS2007 model has several advantages when compared to the RCM model. These include:

- the use of statewide OFFROAD2007 emission factors for off-road equipment,
- on-road equipment emission factors specific to the user-selected geographic area,
- overlapping construction phases,
- the ability to specify as many phases as needed, and
- the capability to report annual emissions.

As compared to RCM, URBEMIS2007 represents a more flexible and comprehensive model for estimating construction emissions from large linear projects such as HST.

APPENDIX H

Estimated Emissions from Hauling Ballast Material Memorandum

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MEMORANDUM

To: **Ann Koby/PMT; Bryan Porter/PMT**
From: **Jonathan Tamimi /URS/HMM/Arup; Avanti Tamhane /URS/HMM/Arup**
Date: **7/21/2011**
Subject: **Estimated Emissions from Hauling Ballast Material – Merced to Fresno and Fresno to Bakersfield Sections of the California High-Speed Train Project**

Analysis of pollutant emissions that are associated with hauling railway ballast material needed for the Merced to Fresno and Fresno to Bakersfield Sections of the California High-Speed Train Project are included in the air quality analysis section in Chapter 3 of the *California High-Speed Train Project Environmental Impact Report/Environmental Impact Statement*. Since the construction period for the Merced to Fresno Section and the Fresno to Bakersfield would overlap, the total amount of material and the associated emissions for both sections are analyzed in this memorandum. Air emissions were proportioned based on the material requirement for each section and were then compared to the General Conformity de minimis thresholds as well as the CEQA thresholds.

Over the course of the construction period, the Merced to Fresno and Fresno to Bakersfield Sections will require about 3.9 million cubic yards (cy) of ballast and sub-ballast material (hereby referred to as ballast material), however, this total amount is not currently available within San Joaquin Valley Air Basin (SJVAB), and there would be a need to haul it from quarries located in other air basins. If project material is hauled through other air basins, the associated emissions must be analyzed with respect to pollutant thresholds in the air basins traversed.

This memorandum describes the analysis performed to determine (1) the potential amount of railroad ballast material available from California quarries for the Merced to Fresno and Fresno to Bakersfield Sections of the California High-Speed Train Project and (2) pollutant emissions associated with hauling the materials to the SJVAB boundary.

Quarries Evaluated

The Office of Mine Reclamation (California Department of Conservation [CDC]) provided a list of quarries within the state of California (CDC 2010). The list was screened for active rock quarries with 200 or more acres of permitted area because they are considered to be of sufficient size to serve the demand effectively. Quarries that are in the planning stage and have not received a permit, such as the Jesse Morrow Mountain Quarry in Fresno County and Liberty Quarry in Riverside County, were not considered in the analysis.

A general inquiry call (which did not identify the project) was made to the five quarries that met the screening criteria. The quarries were asked (1) if they could manufacture ballast material to

American Railway Engineering and Maintenance-of-Way Association (AREMA) 4 specifications, (2) the distance from the quarry to the nearest railhead for transport, and (3) the amount of ballast material that could be produced by the quarry in 1 year. Table 1 summarizes the results. Two quarries, Bowman Quarry and Mountain Avenue Pit No. 1 (Elsinore Ready Mix Concrete) met the screening criteria but contact information was not available and, therefore, they were not considered in this analysis.

TABLE 1
Quarry Information

Quarry Name and Address	Distance to SJVAB (rail miles)	AREMA 4 Ballast Availability	Distance to Nearest Railhead	Annual Ballast Production Capacity
Kaiser Eagle Mountain Quarry 1 Court Street Desert Center, CA 92239 (Mojave Air Basin)	350	Yes	Railhead onsite	1,000,000 cy/yr
Napa Quarry 2301 Napa-Vallejo Highway Napa, CA 94558 (San Francisco Bay Air Basin)	70	Yes	Railhead onsite	150,000 tons/yr
Lake Herman Quarry 885 Lake Herman Road Vallejo, CA 94591 (San Francisco Bay Air Basin)	70	Yes	15 miles	200,000 tons/yr
San Rafael Rock Quarry 1000 Point San Pedro Road San Rafael, CA 94901 (San Francisco Bay Air Basin)	55	Yes	15 miles	150,000 tons/yr
Bangor Rock Quarry – Site A 5522 LaPorte Road Bangor, CA 92194 (Sacramento Valley Air Basin)	85	Yes	15 miles	300,000 tons/yr

Methodology for Estimating Pollutant Emissions from Hauling Ballast to the Project Site

As the construction schedules of the Merced to Fresno and Fresno to Bakersfield Sections of the California High Speed Train Project overlap, the ballast material hauling analysis took into account the requirements for both sections to ensure realistic emission estimates. Five scenarios were developed for hauling ballast materials from quarries listed in Table 1 to the boundary of SJVAB to develop a range of emission estimates (the actual hauling scenario during construction

is uncertain). The scenarios represent a range of combinations of supply from the different quarries and different methods of hauling (either by truck to the nearest railhead and railway the remainder of the distance, or by truck the entire distance). The scenarios include the following:

- Scenario 1: All Ballast Hauled from Kaiser Eagle Mountain Quarry by Rail Only – Haul all of the ballast material, for both sites, via rail from the Kaiser Eagle Mountain Quarry (the longest hauling distance).
- Scenario 2: Ballast from Quarries Nearest to the Project by Truck and Rail and Balance from Kaiser Eagle Mountain Quarry by Truck and Rail - Haul all of the ballast material from the quarries closest to the project site (Napa Quarry, Lake Herman Quarry, and San Rafael Rock Quarry) via truck to the nearest railhead, then by railway the remainder of the distance and the balance from Bangor Rock Quarry by truck and rail.
- Scenario 3: Ballast from Quarries Nearest to the Project by Truck and Rail and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry - Haul the maximum amount of ballast available from the quarries closest to the project site (Napa Quarry, Lake Herman Quarry, and San Rafael Rock Quarry), the maximum amount from Bangor Rock Quarry – Site A (which is closer than Kaiser Eagle Mountain Quarry) up to ballast production limits; and then the balance from Kaiser Eagle Mountain Quarry. Haul ballast by truck to the nearest railhead, then by rail the remainder of the distance.
- Scenario 4: Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only – Haul the maximum amount of ballast from the quarries closest to the project site (Napa Quarry, Lake Herman Quarry, and San Rafael Rock Quarry), and obtain the balance of material needed from Bangor Rock Quarry – Site A (closer than Kaiser Eagle Mountain Quarry) and Kaiser Eagle Mountain Quarry, transported by truck for the entire distance.
- Scenario 5: – Maximum Ballast from Quarries Nearest Project and Balance from Kaiser Eagle Mountain Quarry by Truck Only - Haul the maximum amount of ballast up to emission threshold limits from the quarries closest to the project site (Napa Quarry, Lake Herman Quarry, and San Rafael Rock Quarry), and obtain the balance of material needed from Kaiser Eagle Mountain Quarry transported by truck the entire distance.

For each scenario, emissions were calculated using year 2014 emission factors. Year 2014 would be the first year that ballast is required for the project, and emission factors for that year are the most conservative within the project schedule because they are expected to decrease each year as vehicle technology improves. Table 2 provides the emission factors used in the analysis. For unmitigated truck emissions, emission factors were based on a fleet composed of the last 45 model years (1969-2014). Mitigated haul truck emission factors are for a fleet composed of model year 2010 and newer trucks.

TABLE 2
Ballast Hauling Emission Factors

Emission Source	Emission Factors						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2
Unmitigated Haul Trucks (grams/mile)[a]	2.76	7.89	0.313	0.34	0.015	0.423	1561
Mitigated Haul Trucks (grams/mile)[a]	1.02	1.18	0.063	0.068	0.015	0.096	1600
Large Haul Rail (grams/ton-mile)[b]	0.055	0.28	0.0072	0.0074	0.0002	0.013	21.1

[a] Truck emission factors were developed using the EMFAC2007 emissions model and statewide average emission factors.
[b] Railway emission factors were developed using the *Emission Factors for Locomotives* (EPA 2009) and a conversion factor of 484 ton-mile per gallon from *The Environmental Benefits of Moving Freight by Rail,* (The Association of American Railroads, 2010)

Notes:
CO = carbon monoxide
NO_x = nitrogen oxide
$PM_{2.5}$ = particulate matter less than 2.5 micrometers in aerodynamic diameter
PM_{10} = particulate matter less than 10 micrometers in aerodynamic diameter
SO_2 = sulfur dioxide
VOC = volatile organic compound

For each scenario, emissions were calculated by multiplying the emission factor by the distance traveled and the amount of material hauled per trip for each hauling method. The following pollutant emissions were calculated: CO, NOx, $PM_{2.5}$, PM_{10}, SO_2, and VOC. Greenhouse gas (GHG) emissions were also estimated. Emissions were calculated separately for each federal nonattainment or maintenance area through which the materials would be hauled (reference Attachment A). The results were compared to the General Conformity (GC) de minimis values to determine if an exceedance would occur. Emissions were also calculated for each air quality management district (AQMD) or air pollution control district (APCD) that the material was hauled through and compared to daily and annual CEQA significance threshold values for each of the air districts (reference Attachment B). Although the quantity of ballast material being considered was the combined amounts from both sections to ensure plausible scenarios, the emissions for each section were calculated by proportioning out the total air emissions based on the material requirements for each section.

For each scenario, the maximum material hauled in one year was used to estimate the annual emissions. The daily emissions calculations were estimated by assuming that the annual material requirements would be hauled by trucks that would operate 260 days per year and trains that would run twice weekly from each of the railheads to the SJVAB.

Estimated Pollutant Emissions from Hauling Ballast to the Project Site

Tables 3 shows the amounts of material hauled from the quarries for each scenario in cubic yards (cy) per year. For daily emissions calculations, it was assumed trucks would operate 260 days

per year and that trains would run twice weekly from each of the railheads to the SJVAB.

TABLE 3

Amount of Material Hauled from Each Quarry Under Scenarios 1-5

Scenario / Quarry Name	1 (cy/yr)	2 (cy/yr)	3 (cy/yr)	4 (cy/yr)	5 (cy/yr)
Kaiser Eagle Mountain Quarry	939,621	701,526	558,668	558,669	701,526
Napa Quarry	0	71,429	71,429	71,429	71,429
Lake Herman Quarry	0	95,238	95,238	87,139	87,139
San Rafael Rock Quarry	0	71,429	71,429	71,429	71,429
Bangor Rock Quarry – Site A	0	0	142,857	142,857	0

Tables C-1 through C-10 (reference Attachment C) show the estimated unmitigated emissions for the five scenarios relative to the GC de minimis thresholds for the air basins traversed. Tables D-1 through D-20 (reference Attachment D) show the estimated unmitigated emissions relative to CEQA significance thresholds for the AQMDs/APCDs traversed. Tables E-1 through E-8 (reference Attachment E) show estimated mitigated emissions for scenarios 2 through 5 relative to GC de minimis thresholds for the air basins traversed. Tables F-1 through F-16 (reference Attachment F) show the estimated mitigated emissions for scenarios 2 through 5 relative to CEQA significance thresholds for the AQMDs/APCDs traversed. Scenario 1 did not change under the mitigated scenario since tall the material was transported by rail. Please note that a particular air basin could be under the jurisdiction of more than one AQMD.

All five scenarios would result in emissions that exceed the GC de minimis thresholds for NO_X in the Salton Sea Air Basin and South Coast Air Basins for the Fresno to Bakersfield sections without mitigation. Four out of the five scenarios would result in emissions that would exceed the GC de minimis thresholds for NOx for the Merced for Fresno section. In Scenario 3, GC de minimis thresholds for NO_X would not be exceeded in the Salton Sea Air Basin for the Merced to Fresno Section. With a mitigation measure to use a fleet of model year 2010 and newer trucks, Scenarios 4 and 5 no longer exceed any de minimis thresholds in any air basin for either section.

Annual CEQA emission threshold limits would not be exceeded by any of the scenarios for either section. Daily CEQA thresholds for NO_X would be exceeded under Scenario 1 in the Mojave Desert, South Coast AQMDs, and Kern County APCD for both sections. Emissions from Scenarios 2 and 3 would exceed the daily CEQA threshold limits for NO_X in the Bay Area, Mojave Desert, South Coast AQMDs, and East Kern County APCD for both sections. Emissions from Scenarios 4 and 5 would exceed daily CEQA threshold limits for NO_X in the Bay Area and South Coast AQMD for the Fresno to Bakersfield section. For the Merced to Fresno Section, Scenarios 4 and 5 exceed daily CEQA threshold limits for NO_X in the South Coast AQMD only. With the proposed mitigation for haul trucks, Scenarios 4 and 5 would no longer exceed any

daily CEQA threshold limits for both sections.

GHG emissions (in units of CO_2e) from ballast hauling range were calculated by assuming methane and nitrogen dioxide impacts were 5% of the total CO_2 impacts. Total CO_2e impacts ranged from 5,700 to 16,500 metric tons annually, depending on the chosen scenario. The total statewide emissions in 2008 of CO_2e was 477,740,000 metric tons. Material hauling for this project will have a negligible impact (less than 0.1%) on statewide greenhouse gas emissions.

Conclusion

According to this analysis, sufficient ballast material of the type needed for the project is available from quarries within the state of California. General Conformity de minimis pollutant thresholds in nonattainment areas for NO_X would be exceeded in some air basin for each scenario without mitigation. With mitigation, Scenarios 4 and 5 no longer exceed GC de minimis threshold limits for any pollutant for either section. Annual CEQA threshold limits would not be exceeded for either section in any scenario. Daily CEQA NO_X thresholds would be exceeded for certain AQMDs/APCDs for every scenario for both sections without mitigation. With mitigation, Scenarios 4 and 5 would no longer exceed daily CEQA NO_X thresholds for either section. Additionally, material hauling for this project will have a negligible impact on statewide greenhouse gas emissions.

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Attachment A
Air Basins and Nonattainment/Maintenance Areas

TABLE A-1
Air Basins and Nonattainment/Maintenance Areas

Nonattainment/Maintenance Area	Pollutant(s)
Mojave Desert Air Basin	
East Kern County	8-hour ozone, PM_{10}
Western San Bernardino/Los Angeles County	8-hour ozone, PM_{10}
Sacramento Valley Air Basin	
Chico, Butte County	8-hour ozone, $PM_{2.5}$ (2006)
Sacramento Metropolitan Area	8-hour ozone, PM_{10}, $PM_{2.5}$ (2006)
Yuba City	8-hour ozone, $PM_{2.5}$ (2006)
Salton Sea Air Basin	
Coachella Valley, Riverside County	8-hour ozone, PM_{10}
San Francisco Bay Air Basin	
Bay Area	8-hour ozone, $PM_{2.5}$ (2006)
South Coast Air Basin	
Los Angeles County	8-hour ozone, PM_{10}, $PM_{2.5}$ (2006)

Notes:

$PM_{2.5}$ = particulate matter less than 2.5 micrometers in aerodynamic diameter

PM_{10} = particulate matter less than 10 micrometers in aerodynamic diameter

Attachment B
Air Quality Management Districts and CEQA Thresholds

TABLE B-1

Air Quality Management Districts/Air Pollution Control District and CEQA Thresholds

	Daily CEQA Thresholds (lb/day)						Annual CEQ Thresholds (tpy)					
	VOC	**CO**	**NOx**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**CO**	**NOx**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Antelope Valley AQMD	137	548	137	137	82	82	25	100	25	25	15	15
Bay Area AQMD	54	-	54	-	82	54	-	-	-	-	-	-
Butte County AQMD	25	-	-	-	80	-	-	-	-	-	-	-
Kern Country APCD	137	-	137	-	-	-	-	-	-	-	-	-
Feather River AQMD	-	-	-	-	80	-	4.5	-	4.5	-	-	-
Mojave Desert AQMD	137	548	137	137	82	82	25	100	25	25	15	15
Sac Metro AQMD	65	-	85	-	-	-	-	-	-	-	-	-
South Coast AQMD	75	550	100	150	150	55	-	-	-	-	-	-

Notes:

– = no CEQA annual threshold for this pollutant in the AQMD/ APCD

$PM_{2.5}$ = particulate matter less than 2.5 micrometers in aerodynamic diameter

PM_{10} = particulate matter less than 10 micrometers in aerodynamic diameter

tpy = tons per year

Attachment C
Emission Calculations for Scenarios Compared to GC de minimis Thresholds

TABLE C-1
Emissions for Scenario 1 - All Ballast from Kaiser Eagle Mountain Quarry by Rail (Merced to Fresno Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Coachella Valley, Riverside County (Salton Sea)	7.86	***39.9***	1.03	1.06	0.03	1.80	2,736
General Conformity de Minimis	100	***25***	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	2.93	14.9	0.38	0.40	0.01	0.67	1,021
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	5.54	***28.1***	0.73	0.75	0.02	1.27	1,927
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	3.04	15.4	0.40	0.41	0.01	0.70	1,060
General Conformity de Minimis	100	100	–	70	–	50	–

Notes:
– = no de minimis threshold for this pollutant in the air basin

TABLE C-2
Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Merced to Fresno), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	1.27	5.66	0.16	0.17	0.01	0.26	500
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	5.87	***29.8***	0.77	0.79	0.02	1.34	2,043
General Conformity de Minimis	100	***25***	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	2.19	11.1	0.29	0.30	0.01	0.50	763
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	4.13	***21.0***	0.54	0.56	0.01	0.95	1,439
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	2.27	11.5	0.30	0.31	0.01	0.52	791
General Conformity de Minimis	100	100	–	70	–	50	–

Notes:
– = no de minimis threshold for this pollutant in the air basin

TABLE C-3
Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Merced to Fresno Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	1.27	5.66	0.16	0.17	0.01	0.26	500
General Conformity de Minimis	100	100	100	–	100	50	–
Chico, Butte County (Sacramento Valley)	0.39	1.29	0.05	0.05	0.00	0.07	184
General Conformity de Minimis	100	100	100	–	100	50	–
Sacramento Metropolitan Area (Sacramento Valley)	0.29	1.45	0.04	0.04	0.00	0.07	100
General Conformity de Minimis	100	25	100	100	100	25	–
Yuba City, Sutter County (Sacramento Valley)	0.35	1.75	0.05	0.05	0.00	0.08	120
General Conformity de Minimis	–	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	4.67	23.7	0.61	0.63	0.02	1.07	1,627
General Conformity de Minimis	100	25	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	1.74	8.84	0.23	0.24	0.01	0.40	607
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	3.29	***16.7***	0.43	0.44	0.01	0.75	1,146
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	1.81	9.18	0.24	0.24	0.01	0.41	630
General Conformity de Minimis	100	100	–	70	–	50	–

Note:
– = no de minimis threshold for this pollutant in the air basin

TABLE C-4

Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section) , Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	2.16	6.18	0.25	0.26	0.01	0.33	1,109
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	9.21	***26.3***	1.04	1.12	0.05	1.41	4,721
General Conformity de Minimis	100	***25***	–	70	–	25	–
Los Angeles County (South Coast)	10.6	***30.3***	1.20	1.29	0.06	1.63	5,447
General Conformity de Minimis	100	***10***	100	70	100	10	–
Chico, Butte County (Sacramento Valley)	0.37	1.06	0.04	0.05	0.00	0.06	191
General Conformity de Minimis	100	100	100	–	100	50	–
Sacramento Metropolitan Area (Sacramento Valley)	0.70	2.01	0.08	0.09	0.00	0.11	361
General Conformity de Minimis	100	25.0	100	100	100	25	–
Yuba City, Sutter County (Sacramento Valley)	0.85	2.41	0.10	0.10	0.00	0.13	433
General Conformity de Minimis	–	100	100	–	100	50	–

Note:
– = no de minimis threshold for this pollutant in the air basin

TABLE C-5

Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section) , Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	2.16	6.18	0.25	0.26	0.01	0.33	1,109
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	11.57	***33.0***	1.31	1.40	0.06	1.77	5,928
General Conformity de Minimis	100	***25***	–	70	–	25	–
Los Angeles County (South Coast)	13.4	***38.1***	1.51	1.62	0.07	2.04	6,840
General Conformity de Minimis	100	***10***	100	70	100	10	–

Note:
– = no de minimis threshold for this pollutant in the Air Basin

TABLE C-6
Emissions for Scenario 1 - All Ballast from Kaiser Eagle Mountain Quarry by Rail (Fresno to Bakersfield Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Coachella Valley, Riverside County (Salton Sea)	9.13	***46.3***	1.20	1.23	0.03	2.09	3,179
General Conformity de Minimis	100	***25***	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	3.41	17.3	0.45	0.46	0.01	0.78	1,186
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	6.43	***32.6***	0.84	0.87	0.02	1.47	2,238
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	3.54	17.9	0.46	0.48	0.01	0.81	1,231
General Conformity de Minimis	100	100	–	70	–	50	–

Notes:
– = no de minimis threshold for this pollutant in the air basin

TABLE C-7
Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Fresno to Bakersfield Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	1.48	6.58	0.19	0.19	0.01	0.31	581
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	6.82	***34.6***	0.89	0.92	0.02	1.56	2,373
General Conformity de Minimis	100	***25***	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	2.54	12.9	0.33	0.34	0.01	0.58	886
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	4.80	***24.3***	0.63	0.65	0.02	1.10	1,671
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	2.64	13.4	0.35	0.36	0.01	0.60	919
General Conformity de Minimis	100	100	–	70	–	50	–

Notes:
– = no de minimis threshold for this pollutant in the air basin

TABLE C-8
Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Fresno to Bakersfield Section) , Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	1.48	6.58	0.19	0.19	0.01	0.31	581
General Conformity de Minimis	100	100	100	–	100	50	–
Chico, Butte County (Sacramento Valley)	0.45	1.50	0.05	0.06	0.00	0.08	214
General Conformity de Minimis	100	100	100	–	100	50	–
Sacramento Metropolitan Area (Sacramento Valley)	0.33	1.69	0.04	0.04	0.00	0.08	116
General Conformity de Minimis	100	25	100	100	100	25	–
Yuba City, Sutter County (Sacramento Valley)	0.40	2.03	0.05	0.05	0.00	0.09	140
General Conformity de Minimis	–	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	5.43	***27.5***	0.71	0.73	0.02	1.24	1,890
General Conformity de Minimis	100	***25***	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	2.03	10.3	0.27	0.27	0.01	0.46	705
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	3.82	***19.4***	0.50	0.52	0.01	0.88	1,331
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	2.10	10.7	0.28	0.28	0.01	0.48	732
General Conformity de Minimis	100	100	–	70	–	50	–

Note:
– = no de minimis threshold for this pollutant in the air basin

TABLE C-9

Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section) , Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	2.51	7.18	0.28	0.30	0.01	0.38	1,288
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	10.7	***30.6***	1.21	1.30	0.06	1.64	5,483
General Conformity de Minimis	100	***25***	–	70	–	25	–
Los Angeles County (South Coast)	12.4	***35.3***	1.40	1.50	0.07	1.89	6,327
General Conformity de Minimis	100	***10***	100	70	100	10	–
Chico, Butte County (Sacramento Valley)	0.43	1.24	0.05	0.05	0.00	0.07	222
General Conformity de Minimis	100	100	100	–	100	50	–
Sacramento Metropolitan Area (Sacramento Valley)	0.82	2.34	0.09	0.10	0.00	0.13	419
General Conformity de Minimis	100	25	100	100	100	25	–
Yuba City, Sutter County (Sacramento Valley)	0.98	2.80	0.11	0.12	0.01	0.15	503
General Conformity de Minimis	–	100	100	–	100	50	–

Note:

– = no de minimis threshold for this pollutant in the air basin

TABLE C-10

Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section) , Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	2.51	7.18	0.28	0.30	0.01	0.38	1,288
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	13.4	***38.4***	1.52	1.63	0.07	2.06	7,590
General Conformity de Minimis	100	***25***	–	70	–	25	–
Los Angeles County (South Coast)	15.5	***44.3***	1.76	1.88	0.08	2.37	8,758
General Conformity de Minimis	100	***10***	100	70	100	10	–

Note:

– = no de minimis threshold for this pollutant in the Air Basin

Attachment D
Emission Calculations for Scenarios Compared to CEQA Thresholds

TABLE D-1

Emissions for Scenario 1 - All Ballast from Kaiser Eagle Mountain Quarry by Rail (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
San Bernardino/Los Angeles County (Mojave Desert AQMD)	2.93	14.9	0.38	0.40	0.01	0.67	1,021
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	13.4	67.9	1.76	1.81	0.05	3.07	4,663
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	3.04	15.4	0.40	0.41	0.01	0.70	1,060
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Notes:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-2
Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	1.27	5.66	0.16	0.17	0.01	0.26	500
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
San Bernardino/Los Angeles County (Mojave Desert AQMD)	2.19	11.1	0.29	0.30	0.01	0.50	763
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	10.00	50.7	1.31	1.35	0.04	2.29	3,482
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	2.27	11.5	0.30	0.31	0.01	0.52	791
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Notes:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-3
Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	1.27	5.66	0.16	0.17	0.01	0.26	500
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Chico, Butte County (Butte County AQMD)	0.39	1.29	0.05	0.05	0.00	0.07	184
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	0.29	1.45	0.04	0.04	0.00	0.07	100
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Yuba City, Sutter County (Feather River AQMD)	0.35	1.75	0.05	0.05	0.00	0.08	120
CEQA Annual Threshold Limits	–	4.5	–	–	–	4.5	–
San Bernardino/Los Angeles County (Mojave Desert AQMD)	1.74	8.84	0.23	0.24	0.01	0.40	607
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	7.96	40.4	1.04	1.08	0.03	1.82	2,773
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	1.81	9.18	0.24	0.24	0.01	0.41	630
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-4
Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	2.16	6.18	0.25	0.26	0.01	0.33	1,109
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Los Angeles County/Riverside County (South Coast AQMD)	19.8	56.6	2.25	2.41	0.11	3.04	10,167
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Chico, Butte County (Butte County AQMD)	0.37	1.06	0.04	0.05	0.00	0.06	191
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	0.70	2.01	0.08	0.09	0.00	0.11	361
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Yuba City, Sutter County Feather River AQMD	0.85	2.41	0.10	0.10	0.00	0.13	433
CEQA Annual Threshold Limits	–	4.5	–	–	–	4.5	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-5
Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	2.16	6.18	0.25	0.26	0.01	0.33	1,109
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Los Angeles County/Riverside County (South Coast AQMD)	24.9	71.1	2.82	3.02	0.14	3.81	12,767
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-6
Emissions for Scenario 1 - All Ballast from Kaiser Eagle Mountain Quarry by Rail (Fresno to Bakersfield Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
San Bernardino/Los Angeles County (Mojave Desert AQMD)	3.41	17.3	0.45	0.46	0.01	0.78	1,186
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	15.6	78.9	2.04	2.10	0.06	3.56	5,417
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	3.54	17.9	0.46	0.48	0.01	0.81	1,231
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Notes:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-7
Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Fresno to Bakersfield Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	1.48	6.58	0.19	0.19	0.01	0.31	581
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
San Bernardino/Los Angeles County (Mojave Desert AQMD)	2.54	12.9	0.33	0.34	0.01	0.58	886
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	10.7	54.1	1.40	1.44	0.04	2.44	4,044
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	2.64	13.4	0.35	0.36	0.01	0.60	919
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Notes:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-8
Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Fresno to Bakersfield Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	1.48	6.58	0.19	0.19	0.01	0.31	581
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Chico, Butte County (Butte County AQMD)	0.45	1.50	0.05	0.06	0.00	0.08	214
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	0.33	1.69	0.04	0.04	0.00	0.08	116
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Yuba City, Sutter County (Feather River AQMD)	0.40	2.03	0.05	0.05	0.00	0.09	140
CEQA Annual Threshold Limits	–	4.5	–	–	–	4.5	–
San Bernardino/Los Angeles County (Mojave Desert AQMD)	2.03	10.3	0.27	0.27	0.01	0.46	705
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	3.82	19.4	0.50	0.52	0.01	0.88	3,221
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	2.10	10.7	0.28	0.28	0.01	0.48	732
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-9
Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	2.51	7.18	0.28	0.30	0.01	0.38	1,288
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Chico, Butte County (Butte County AQMD)	0.43	1.24	0.05	0.05	0.00	0.07	222
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	0.82	2.34	0.09	0.10	0.00	0.13	419
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Yuba City, Sutter County Feather River AQMD	0.98	2.80	0.11	0.12	0.01	0.15	503
CEQA Annual Threshold Limits	–	4.5	–	–	–	4.5	–
Los Angeles County/Riverside County (South Coast AQMD)	21.6	61.6	2.44	2.61	0.12	3.30	11,810
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-10
Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	2.51	7.18	0.28	0.30	0.01	0.38	1,288
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Los Angeles County/Riverside County (South Coast AQMD)	27.1	77.3	3.07	3.28	0.15	4.14	16,348
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE D-11
Emissions for Scenario 1 - All Ballast from Kaiser Eagle Mountain Quarry by Rail (Merced to Fresno Section), Comparison to Daily CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Merced to Fresno					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
San Bernardino/Los Angeles County (Mojave Desert AQMD)	56.4	***286***	7.40	7.63	0.20	12.9
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	258	***1306***	33.8	34.8	0.93	59.0
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	58.5	***297***	7.68	7.92	0.21	13.4
CEQA Daily Threshold Limits	–	***137***	–	–	–	137

Notes:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-12
Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Merced to Fresno Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Merced to Fresno					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	20.4	***97.3***	2.62	2.72	0.08	4.46
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
San Bernardino/Los Angeles County (Mojave Desert AQMD)	42	***214***	6	6	0	10
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	192	***975***	25	26	1	44
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	44	***222***	6	6	0	10
CEQA Daily Threshold Limits	-	***137***	-	-	-	137

Notes:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-13
Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Merced to Fresno Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Merced to Fresno					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	20.4	***97.3***	2.62	2.72	0.08	4.46
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
Chico, Butte County (Butte County AQMD)	3.94	14.8	0.48	0.50	0.02	0.73
CEQA Daily Threshold Limits	–	–	–	80	–	25
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	5.50	27.9	0.72	0.74	0.02	1.26
CEQA Daily Threshold Limits	–	85	–	–	–	65
Yuba City, Sutter County (Feather River AQMD)	6.64	***33.6***	0.87	0.90	0.02	1.52
CEQA Daily Threshold Limits	–	***25***	–	80	–	25
San Bernardino/Los Angeles County (Mojave Desert AQMD)	33.5	***170***	4.40	4.54	0.12	7.69
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	153	***777***	20.1	20.7	0.55	35.1
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	34.8	***177***	4.57	4.71	0.13	7.98
CEQA Daily Threshold Limits	–	***137***	–	–	–	137

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-14
Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Merced to Fresno					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	16.7	47.5	1.89	2.02	0.09	2.55
CEQA Daily Threshold Limits	–	54	54	82	–	54
Los Angeles County/Riverside County (South Coast AQMD)	153	***436***	17.3	18.5	0.83	23.4
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
Chico, Butte County (Butte County AQMD)	2.87	8.18	0.32	0.35	0.02	0.44
CEQA Daily Threshold Limits	–	–	–	80	–	25
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	5.42	15.5	0.61	0.66	0.03	0.83
CEQA Daily Threshold Limits	–	85	–	–	–	65
Yuba City, Sutter County (Feather River AQMD)	6.51	18.6	0.74	0.79	0.04	1.00
CEQA Daily Threshold Limits	–	85	–	–	–	65

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-15
Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Merced to Fresno					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	16.7	47.5	1.89	2.02	0.09	2.55
CEQA Daily Threshold Limits	–	54	54	82	–	54
Los Angeles County/Riverside County (South Coast AQMD)	191	***547***	21.7	23.2	1.04	29.3
CEQA Daily Threshold Limits	550	***100***	55	150	150	75

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-16
Emissions for Scenario 1 - All Ballast from Kaiser Eagle Mountain Quarry by Rail (Fresno to Bakersfield Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Fresno to Bakersfield					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
San Bernardino/Los Angeles County (Mojave Desert AQMD)	65.5	***332***	8.60	8.86	0.24	15.01
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	299	***1517***	39.3	40.5	1.08	68.6
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	68.0	***345***	8.92	9.20	0.25	15.58
CEQA Daily Threshold Limits	–	***137***	–	–	–	137

Notes: – = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-17
Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Fresno to Bakersfield Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Fresno to Bakersfield					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	23.7	***113***	3.05	3.16	0.09	5.18
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
San Bernardino/Los Angeles County (Mojave Desert AQMD)	48.9	***248***	6.42	6.62	0.18	11.2
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	205	***1040***	26.9	27.7	0.74	47.0
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	50.8	***258***	6.66	6.87	0.18	11.6
CEQA Daily Threshold Limits	–	***137***	–	–	–	137

Notes:

– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-18
Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Fresno to Bakersfield Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Fresno to Bakersfield					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	23.7	***113***	3.05	3.16	0.09	5.18
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
Chico, Butte County (Butte County AQMD)	4.58	17.2	0.55	0.58	0.02	0.84
CEQA Daily Threshold Limits	–	–	–	80	–	25
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	6.39	32.4	0.84	0.86	0.02	1.46
CEQA Daily Threshold Limits	–	85	–	–	–	65
Yuba City, Sutter County (Feather River AQMD)	7.71	39.0	1.01	1.04	0.03	1.77
CEQA Daily Threshold Limits	–	25	–	80	–	25
San Bernardino/Los Angeles County (Mojave Desert AQMD)	39.0	***198***	5.11	5.27	0.14	8.93
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	73.5	***373***	9.64	9.94	0.27	16.84
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	40.4	***205***	5.30	5.47	0.15	9.26
CEQA Daily Threshold Limits	–	***137***	–	–	–	137

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-19
Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Fresno to Bakersfield					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	19.3	***55.2***	2.19	2.34	0.10	2.96
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
Los Angeles County/Riverside County (South Coast AQMD)	166	***473***	19	20	1	25
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
Chico, Butte County (Butte County AQMD)	3.33	9.50	0.38	0.40	0.02	0.51
CEQA Daily Threshold Limits	–	–	–	80	–	25
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	6.30	18.0	0.71	0.76	0.03	0.96
CEQA Daily Threshold Limits	–	85	–	–	–	65
Yuba City, Sutter County (Feather River AQMD)	7.56	21.6	0.86	0.92	0.04	1.16
CEQA Daily Threshold Limits	–	85	–	–	–	65

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE D-20
Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD	Emissions (pounds per day) Fresno to Bakersfield					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	19.3	***55.2***	2.19	2.34	0.10	2.96
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
Los Angeles County/Riverside County (South Coast AQMD)	208	***595***	23.6	25.2	1.13	31.9
CEQA Daily Threshold Limits	550	***100***	55	150	150	75

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

Attachment E
Mitigated Emission Calculations for Scenarios Compared to GCR de minimis Thresholds

TABLE E-1
Mitigated Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Merced to Fresno Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	1.05	4.81	0.13	0.13	0.01	0.22	505
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	5.87	***29.8***	0.77	0.79	0.02	1.34	2,042
General Conformity de Minimis	100	***25***	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	2.19	11.1	0.29	0.30	0.01	0.50	762
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	4.13	***21.0***	0.54	0.56	0.01	0.95	1,438
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	2.27	11.5	0.30	0.31	0.01	0.52	791
General Conformity de Minimis	100	100	–	70	–	50	–

Notes:

– = no de minimis threshold for this pollutant in the air basin

TABLE E-2
Mitigated Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Merced to Fresno Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	1.05	4.81	0.13	0.13	0.01	0.22	505
General Conformity de Minimis	100	100	100	–	100	50	–
Chico, Butte County (Sacramento Valley)	0.20	0.56	0.02	0.02	0.00	0.03	187
General Conformity de Minimis	100	100	100	–	100	50	–
Sacramento Metropolitan Area (Sacramento Valley)	0.29	1.45	0.04	0.04	0.00	0.07	120
General Conformity de Minimis	100	25	100	100	100	25	–
Yuba City, Sutter County (Sacramento Valley)	0.35	1.75	0.05	0.05	0.00	0.08	99
General Conformity de Minimis	–	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	4.67	23.7	0.61	0.63	0.02	1.07	1,626
General Conformity de Minimis	100	25	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	1.74	8.84	0.23	0.24	0.01	0.40	607
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	3.29	***16.7***	0.43	0.44	0.01	0.75	1,145
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	1.81	9.18	0.24	0.24	0.01	0.41	630
General Conformity de Minimis	100	100	–	70	–	50	–

Note:
– = no de minimis threshold for this pollutant in the air basin

TABLE E-3
Mitigated Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	0.80	0.93	0.05	0.05	0.01	0.08	1,137
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	3.41	3.94	0.21	0.23	0.05	0.32	4,838
General Conformity de Minimis	100	25	–	70	–	25	–
Los Angeles County (South Coast)	3.93	4.55	0.24	0.26	0.06	0.37	5,582
General Conformity de Minimis	100	10	100	70	100	10	–
Chico, Butte County (Sacramento Valley)	0.14	0.16	0.01	0.01	0.00	0.01	196
General Conformity de Minimis	100	100	100	–	100	50	–
Sacramento Metropolitan Area (Sacramento Valley)	0.26	0.30	0.02	0.02	0.00	0.02	444
General Conformity de Minimis	100	25.0	100	100	100	25	–
Yuba City, Sutter County (Sacramento Valley)	0.31	0.36	0.02	0.02	0.00	0.03	370
General Conformity de Minimis	–	100	100	–	100	50	–

Note:
– = no de minimis threshold for this pollutant in the air basin

TABLE E-4
Mitigated Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	0.80	0.93	0.05	0.05	0.01	0.08	1,137
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	4.28	4.95	0.26	0.28	0.06	0.40	6,075
General Conformity de Minimis	100	25	–	70	–	25	–
Los Angeles County (South Coast)	4.94	5.71	0.30	0.33	0.07	0.46	7,010
General Conformity de Minimis	100	10	100	70	100	10	–

Note:
– = no de minimis threshold for this pollutant in the Air Basin

TABLE E-5
Mitigated Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Fresno to Bakersfield Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	1.22	5.59	0.15	0.15	0.01	0.26	586
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	6.82	***34.6***	0.89	0.92	0.02	1.56	2,373
General Conformity de Minimis	100	***25***	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	2.54	12.9	0.33	0.34	0.01	0.58	886
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	4.80	***24.3***	0.63	0.65	0.02	1.10	1,671
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	2.64	13.4	0.35	0.36	0.01	0.60	919
General Conformity de Minimis	100	100	–	70	–	50	–

Notes:

– = no de minimis threshold for this pollutant in the air basin

TABLE E-6
Mitigated Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Fresno to Bakersfield Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	1.22	5.59	0.15	0.15	0.01	0.26	586
General Conformity de Minimis	100	100	100	–	100	50	–
Chico, Butte County (Sacramento Valley)	0.23	0.65	0.02	0.02	0.00	0.03	218
General Conformity de Minimis	100	100	100	–	100	50	–
Sacramento Metropolitan Area (Sacramento Valley)	0.33	1.69	0.04	0.04	0.00	0.08	116
General Conformity de Minimis	100	25	100	100	100	25	–
Yuba City, Sutter County (Sacramento Valley)	0.40	2.03	0.05	0.05	0.00	0.09	140
General Conformity de Minimis	–	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	5.43	***27.5***	0.71	0.73	0.02	1.24	1,890
General Conformity de Minimis	100	***25***	–	70	–	25	–
Western San Bernardino/Los Angeles County (Mojave Desert)	2.03	10.3	0.27	0.27	0.01	0.46	705
General Conformity de Minimis	100	100	–	100	–	50	–
Los Angeles County (South Coast)	3.82	***19.4***	0.50	0.52	0.01	0.88	1,331
General Conformity de Minimis	100	***10***	100	70	100	10	–
East Kern County (Mojave Desert)	2.10	10.7	0.28	0.28	0.01	0.48	732
General Conformity de Minimis	100	100	–	70	–	50	–

Note:
– = no de minimis threshold for this pollutant in the air basin

TABLE E-7
Mitigated Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	0.93	1.08	0.06	0.06	0.01	0.09	1,320
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	3.96	4.58	0.24	0.26	0.06	0.37	5,620
General Conformity de Minimis	100	25	–	70	–	25	–
Los Angeles County (South Coast)	4.57	5.28	0.28	0.30	0.07	0.43	6,485
General Conformity de Minimis	100	10	100	70	100	10	–
Chico, Butte County (Sacramento Valley)	0.16	0.19	0.01	0.01	0.00	0.02	227
General Conformity de Minimis	100	100	100	–	100	50	–
Sacramento Metropolitan Area (Sacramento Valley)	0.30	0.35	0.02	0.02	0.00	0.03	430
General Conformity de Minimis	100	25	100	100	100	25	–
Yuba City, Sutter County (Sacramento Valley)	0.36	0.42	0.02	0.02	0.01	0.03	516
General Conformity de Minimis	–	100	100	–	100	50	–

Note:
– = no de minimis threshold for this pollutant in the air basin

TABLE E-8
Mitigated Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to GC de Minimis Thresholds

Nonattainment/Maintenance Area (Air Basin)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (San Francisco Bay)	0.93	1.08	0.06	0.06	0.01	0.09	1,320
General Conformity de Minimis	100	100	100	–	100	50	–
Coachella Valley, Riverside County (Salton Sea)	4.97	5.75	0.31	0.33	0.07	0.47	7,057
General Conformity de Minimis	100	25	–	70	–	25	–
Los Angeles County (South Coast)	5.73	6.63	0.35	0.38	0.08	0.54	8,143
General Conformity de Minimis	100	10	100	70	100	10	–

Note:
– = no de minimis threshold for this pollutant in the Air Basin

Attachment F
Mitigated Emission Calculations for Scenarios Compared to CEQA Thresholds

TABLE F-1
Mitigated Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	1.05	4.81	0.13	0.13	0.01	0.22	505
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
San Bernardino/Los Angeles County (Mojave Desert AQMD)	2.19	11.1	0.29	0.30	0.01	0.50	763
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	10.00	50.7	1.31	1.35	0.04	2.29	3,482
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	2.27	11.5	0.30	0.31	0.01	0.52	791
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Notes:

– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE F-2
Mitigated Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	1.05	4.81	0.13	0.13	0.01	0.22	505
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Chico, Butte County (Butte County AQMD)	0.20	0.56	0.02	0.02	0.00	0.03	188
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	0.29	1.45	0.04	0.04	0.00	0.07	100
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Yuba City, Sutter County (Feather River AQMD)	0.35	1.75	0.05	0.05	0.00	0.08	120
CEQA Annual Threshold Limits	–	4.5	–	–	–	4.5	–
San Bernardino/Los Angeles County (Mojave Desert AQMD)	1.74	8.84	0.23	0.24	0.01	0.40	607
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	7.96	40.4	1.04	1.08	0.03	1.82	2,773
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	1.81	9.18	0.24	0.24	0.01	0.41	630
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE F-3
Mitigated Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	0.80	0.93	0.05	0.05	0.01	0.08	1,137
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Los Angeles County/Riverside County (South Coast AQMD)	7.34	8.49	0.45	0.49	0.11	0.69	10,421
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Chico, Butte County (Butte County AQMD)	0.14	0.16	0.01	0.01	0.00	0.01	196
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	0.26	0.30	0.02	0.02	0.00	0.02	444
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Yuba City, Sutter County (Feather River AQMD)	0.31	0.36	0.02	0.02	0.00	0.03	370
CEQA Annual Threshold Limits	–	4.5	–	–	–	4.5	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE F-4
Mitigated Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to CEQA Annual Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Merced to Fresno						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	0.80	0.93	0.05	0.05	0.01	0.08	1,137
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Los Angeles County/Riverside County (South Coast AQMD)	9.21	10.7	0.57	0.61	0.14	0.87	13,085
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE F-5
Mitigated Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Fresno to Bakersfield Section), Comparison to Annual CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	**NO_x**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**	**VOC**	**CO_2 (Metric Tons)**
Bay Area (Bay Area AQMD)	1.22	5.59	0.15	0.15	0.01	0.26	586
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
San Bernardino/Los Angeles County (Mojave Desert AQMD)	2.54	12.9	0.33	0.34	0.01	0.58	886
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	10.7	54.1	1.40	1.44	0.04	2.44	4,044
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	2.64	13.4	0.35	0.36	0.01	0.60	919
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Notes:

– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE F-6
Mitigated Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Fresno to Bakersfield Section), Comparison to Annual CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	1.22	5.59	0.15	0.15	0.01	0.26	586
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Chico, Butte County (Butte County AQMD)	0.23	0.65	0.02	0.02	0.00	0.03	218
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	0.33	1.69	0.04	0.04	0.00	0.08	116
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Yuba City, Sutter County (Feather River AQMD)	0.40	2.03	0.05	0.05	0.00	0.09	140
CEQA Annual Threshold Limits	–	4.5	–	–	–	4.5	–
San Bernardino/Los Angeles County (Mojave Desert AQMD)	2.03	10.3	0.27	0.27	0.01	0.46	705
CEQA Annual Threshold Limits	100	25	15	15	25	25	–
Los Angeles County/Riverside County (South Coast AQMD)	3.82	19.4	0.50	0.52	0.01	0.88	3,221
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
East Kern County (Kern County APCD)	2.10	10.7	0.28	0.28	0.01	0.48	732
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE F-7
Mitigated Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to Annual CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	0.93	1.08	0.06	0.06	0.01	0.09	1,320
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Chico, Butte County Butte County AQMD	0.16	0.19	0.01	0.01	0.00	0.02	227
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	0.30	0.35	0.02	0.02	0.00	0.03	430
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Yuba City, Sutter County (Feather River AQMD)	0.36	0.42	0.02	0.02	0.01	0.03	516
CEQA Annual Threshold Limits	–	4.5	–	–	–	4.5	–
Los Angeles County/Riverside County (South Coast AQMD)	7.97	9.22	0.49	0.53	0.12	0.75	12,105
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE F-8
Mitigated Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to Annual CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (tons per year) Fresno to Bakersfield						
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	CO_2 (Metric Tons)
Bay Area (Bay Area AQMD)	0.93	1.08	0.06	0.06	0.01	0.09	1,320
CEQA Annual Threshold Limits	–	–	–	–	–	–	–
Los Angeles County/Riverside County (South Coast AQMD)	10.01	11.58	0.62	0.67	0.15	0.94	15,200
CEQA Annual Threshold Limits	–	–	–	–	–	–	–

Note:
– = no CEQA annual threshold for this pollutant in the AQMD/APCD

TABLE F-9

Mitigated Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Merced to Fresno Section), Comparison to CEQA Daily Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	**Emissions (pounds per day) Merced to Fresno**					
	CO	**NO_x**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**	**VOC**
Bay Area (Bay Area AQMD)	18.7	***90.7***	2.38	2.46	0.08	4.14
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
San Bernardino/Los Angeles County (Mojave Desert AQMD)	42	***214***	6	6	0	10
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	192	***975***	25	26	1	44
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	44	***222***	6	6	0	10
CEQA Daily Threshold Limits	-	***137***	-	-	-	137

Notes:

– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE F-10
Mitigated Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Merced to Section), Comparison to Daily CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Merced to Fresno					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	18.7	***90.7***	2.38	2.46	0.08	4.14
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
Chico, Butte County Butte County AQMD	2.48	9.20	0.27	0.28	0.02	0.45
CEQA Daily Threshold Limits	–	–	–	80	–	25
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	5.50	27.9	0.72	0.74	0.02	1.26
CEQA Daily Threshold Limits	–	85	–	–	–	65
Yuba City, Sutter County (Feather River AQMD)	6.64	***33.6***	0.87	0.90	0.02	1.52
CEQA Daily Threshold Limits	–	***25***	–	80	–	25
San Bernardino/Los Angeles County (Mojave Desert AQMD)	33.5	***170***	4.40	4.54	0.12	7.69
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	153	***777***	20.1	20.7	0.55	35.1
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	34.8	***177***	4.57	4.71	0.13	7.98
CEQA Daily Threshold Limits	–	***137***	–	–	–	137

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE F-11
Mitigated Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno Section), Comparison to Daily CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Merced to Fresno					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	6.16	7.12	0.38	0.41	0.09	0.58
CEQA Daily Threshold Limits	–	54	54	82	–	54
Los Angeles County/Riverside County (South Coast AQMD)	56.4	65.3	3.48	3.76	0.83	5.30
CEQA Daily Threshold Limits	550	100	55	150	150	75
Chico, Butte County Butte County AQMD	1.06	1.23	0.07	0.07	0.02	0.10
CEQA Daily Threshold Limits	–	–	–	80	–	25
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	2.00	2.32	0.12	0.13	0.03	0.19
CEQA Daily Threshold Limits	–	85	–	–	–	65
Yuba City, Sutter County (Feather River AQMD)	2.41	2.78	0.15	0.16	0.04	0.23
CEQA Daily Threshold Limits	–	85	–	–	–	65

Note:
– = no CEQA daily threshold for this pollutant in the AQMD

TABLE F-12
Mitigated Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Merced to Fresno), Comparison to Daily CEQA thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Merced to Fresno					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	6.16	7.12	0.38	0.41	0.09	0.58
CEQA Daily Threshold Limits	–	54	54	82	–	54
Los Angeles County/Riverside County (South Coast AQMD)	70.9	82.0	4.37	4.72	1.04	6.66
CEQA Daily Threshold Limits	550	100	55	150	150	75

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE F-13
Mitigated Emissions for Scenario 2 –Ballast from Quarries Nearest Project and Balance From Kaiser Eagle Quarry by Rail and Truck (Fresno to Bakersfield Section), Comparison to Daily CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	**Emissions (pounds per day) Fresno to Bakersfield**					
	CO	**NO_x**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**	**VOC**
Bay Area (Bay Area AQMD)	21.7	105	2.76	2.85	0.09	4.81
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
San Bernardino/Los Angeles County (Mojave Desert AQMD)	48.9	***248***	6.42	6.62	0.18	11.2
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	205	***1040***	26.9	27.7	0.74	47.0
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	50.8	***258***	6.66	6.87	0.18	11.6
CEQA Daily Threshold Limits	–	***137***	–	–	–	137

Notes:

– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE F-14
Mitigated Emissions for Scenario 3 - Ballast from a Mixture of Quarries by Truck and Rail (Fresno to Bakersfield Section), Comparison to Daily CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Fresno to Bakersfield					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	21.6	***105***	2.76	2.85	0.09	4.81
CEQA Daily Threshold Limits	–	***54***	54	82	–	54
Chico, Butte County Butte County AQMD	2.88	10.7	0.31	0.32	0.02	0.52
CEQA Daily Threshold Limits	–	–	–	80	–	25
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	6.39	32.4	0.84	0.86	0.02	1.46
CEQA Daily Threshold Limits	–	85	–	–	–	65
Yuba City, Sutter County (Feather River AQMD)	7.71	39.1	1.01	1.04	0.03	1.77
CEQA Daily Threshold Limits	–	25	–	80	–	25
San Bernardino/Los Angeles County (Mojave Desert AQMD)	39.0	***198***	5.11	5.27	0.14	8.93
CEQA Daily Threshold Limits	548	***137***	82	82	137	137
Los Angeles County/Riverside County (South Coast AQMD)	73.5	***373***	9.64	9.94	0.27	16.84
CEQA Daily Threshold Limits	550	***100***	55	150	150	75
East Kern County (Kern County APCD)	40.4	***205***	5.30	5.47	0.15	9.26
CEQA Daily Threshold Limits	–	***137***	–	–	–	137

Note:
– = no CEQA daily threshold for this pollutant in the AQMD/APCD

TABLE F-15
Mitigated Emissions for Scenario 4 - Maximum Ballast from Quarries Nearest to the Project and Balance from Bangor Rock Quarry and Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to Daily CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Fresno to Bakersfield					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	7.15	8.27	0.44	0.48	0.10	0.67
CEQA Daily Threshold Limits	–	54	54	82	–	54
Los Angeles County/Riverside County (South Coast AQMD)	61.3	70.9	3.78	4.08	0.90	5.76
CEQA Daily Threshold Limits	550	100	55	150	150	75
Chico, Butte County Butte County AQMD	1.23	1.42	0.08	0.08	0.02	0.12
CEQA Daily Threshold Limits	–	–	–	80	–	25
Sacramento Metropolitan Area (Sacramento Metropolitan AQMD)	2.33	2.69	0.14	0.15	0.03	0.22
CEQA Daily Threshold Limits	–	85	–	–	–	65
Yuba City, Sutter County (Feather River AQMD)	2.79	3.23	0.17	0.19	0.04	0.26
CEQA Daily Threshold Limits	–	85	–	–	–	65

Note:
– = no CEQA daily threshold for this pollutant in the AQMD

TABLE F-16
Mitigated Emissions for Scenario 5 - Maximum Ballast from Quarries Nearest Project Balance from Kaiser Eagle Mountain Quarry by Truck Only (Fresno to Bakersfield Section), Comparison to Daily CEQA Thresholds

Air Quality Management District/ Air Pollution Control District (AQMD/APCD)	Emissions (pounds per day) Fresno to Bakersfield					
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC
Bay Area (Bay Area AQMD)	7.15	8.27	0.44	0.48	0.10	0.67
CEQA Daily Threshold Limits	–	54	54	82	–	54
Los Angeles County/Riverside County (South Coast AQMD)	77.01	89.1	4.75	5.12	1.13	7.23
CEQA Daily Threshold Limits	550	100	55	150	150	75

Note:
– = no CEQA daily threshold for this pollutant in the AQMD