

**Table 4.6.3. CONCURRENT OPERATION AND PHASED CONSTRUCTION
EMISSIONS - POUNDS PER HOUR**

Source	CO	NO_x	SO₂	PM₁₀	PM_{2.5}	VOC	CO_{2e}	PM	HAP
Worker Commuting	0.31	0.03	<0.01	<0.01	<0.01	0.03	55.17	<0.01	<0.01
Deliveries	0.77	2.12	<0.01	0.10	0.09	0.18	421.11	<0.01	<0.01
Road Emissions	<0.01	<0.01	<0.01	0.05	0.01	<0.01	<0.01	0.50	--
Ongoing Construction	0.57	1.23	<0.01	1.42	0.21	1.39	229.97	1.36	<0.01
Total	1.64	3.38	<0.01	1.58	0.30	1.60	706.25	1.86	<0.01

Sources: (CARB 2007), (WRAP 2006), (AP42 2006), and (TCEQ 2001)

**Table 4.6.4. CONCURRENT OPERATION AND PHASED CONSTRUCTION
EMISSIONS – TONS PER YEAR**

Source	CO	NO_x	SO₂	PM₁₀	PM_{2.5}	VOC	CO_{2e}	PM	HAP
Worker Commuting	5.60	0.55	0.01	0.08	0.05	0.61	1006.86	<0.01	0.01
Deliveries	2.80	7.75	0.01	0.38	0.32	0.65	1537.06	<0.01	0.01
Road Emissions	<0.01	<0.01	<0.01	0.12	0.01	<0.01	<0.01	1.09	--
Ongoing Construction	1.19	1.49	<0.01	1.46	0.22	0.73	371.47	1.40	<0.01
Total	9.59	9.79	0.02	2.04	0.61	1.98	2,915.39	2.49	0.01

Sources: (CARB 2007), (WRAP 2006), (AP42 2006), and (TCEQ 2001)

9.59 9.79 0.02 2.04 0.61 1.98 2915.39 2.49 0.01

Table 4.6 Emissions - - WORKER COMMUTING EMISSIONS
 Highest (Most Conservative) EMFAC2007 (version 2.3)
 Emission Factors for On-Road Passenger Vehicles & Delivery Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)

Vehicle Class:

Passenger Vehicles (<8500 pounds) & Delivery Trucks (>8500 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model, taking the weighted average of vehicle types and simplifying into two categories: Passenger Vehicles & Delivery Trucks.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle categories listed in the tables below, by use of the following equation:

$$\text{Emissions (pounds per day)} = N \times \text{TL} \times \text{EF}$$

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

This methodology replaces the old EMFAC emission factors in Tables A-9-5-J-1 through A-9-5-L in Appendix A9 of the current SCAQMD CEQA Handbook. All the emission factors account for the emissions from start, running and idling exhaust. In addition, the ROG emission factors include diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors include tire and brake wear.

Scenario Year: 2015

All model years in the range 1971 to 2015

Passenger Vehicles (pounds/mile)		Delivery Trucks (pounds/mile)	
CO	0.00614	CO	0.01169
NOx	0.00060	NOx	0.01285
SOx	0.00001	SOx	0.00003
PM10	0.00009	PM10	0.00050
PM2.5	0.00006	PM2.5	0.00041
CO2	1.10193	CO2	2.81248
CH4	0.00006	CH4	0.00008

Number of Workers		50									
Average Trip Length		50									
Days of Operations / Year		365									
Pollutant		CO	NOx	SO2	PM10	PM2.5	VOC	HAP	CO2	CH4	CO2e
Emission Factor	(Lbs/Mile)	0.00614	0.00060	0.00001	0.00009	0.00006	0.00066	0.00001	1.10193	0.00006	1.10341
Emissions	(Total Lbs)	5,604	549	10	84	55	605	6.05	1,005,510	54.04	1,006,861
	(PPH)	0.31	0.03	0.00	0.00	0.00	0.03	0.00	55.10	0.00	55.17
	(Tons)	2.80	0.27	0.00	0.04	0.03	0.30	0.00	502.75	0.03	503.43
	(TPY)	5.60	0.55	0.01	0.08	0.05	0.61	0.01	1005.51	0.05	1006.86

NOTE: Emissions show as "0.00" are <0.01.

NOTE: HAP assumed to be 1% of VOC emissions based on HAP to VOC ratio listed in AP-42 Tables 3.3-1 and 3.3-2.

Table 4.6 Emissions -DELIVERY EMISSIONS
 Highest (Most Conservative) EMFAC2007 (version 2.3)
 Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks
 Projects in the SCAQMD (Scenario Years 2007 - 2026)
 Derived from Peak Emissions Inventory (Winter, Annual, Summer)

Vehicle Class:

Heavy-Heavy-Duty Diesel Trucks (33,001 to 60,000 pounds)

The following emission factors were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and extracting the Heavy-Heavy-Duty Diesel Truck (HHDT) Emission Factors.

These emission factors can be used to calculate on-road mobile source emissions for the vehicle/emission categories listed in the tables below, by use of the following equation:

$$\text{Emissions (pounds per day)} = N \times TL \times EF$$

where N = number of trips, TL = trip length (miles/day), and EF = emission factor (pounds per mile)

The HHDT-DSL vehicle/emission category accounts for all emissions from heavy-heavy-duty diesel trucks, including start, running and idling exhaust. In addition, ROG emission factors account for diurnal, hot soak, running and resting emissions, and the PM10 & PM2.5 emission factors account for tire and brake wear.

The HHDT-DSL, Exh vehicle/emission category includes only the exhaust portion of PM10 & PM2.5 emissions from heavy-heavy-duty diesel trucks.

Scenario Year: 2015
 All model years in the range 1971 to 2015

HHDT-DSL (pounds/mile)		HHDT-DSL, Exh (pounds/mile)	
CO	0.00767	PM10	0.00091
NOx	0.02123	PM2.5	0.00083
SOx	0.00004		
PM10	0.00105		
PM2.5	0.00088		
CO2	4.20902		
CH4	0.00008		

Material Loads		3650									
Average Trip Length		100									
Pollutant		CO	NOx	SO2	PM10	PM2.5	VOC	HAP	CO2	CH4	CO2e
Emission Factor	(Lbs/Mile)	0.00767	0.02123	0.00004	0.00105	0.00088	0.00179	0.00002	4.20902	0.00008	4.21
Emissions	(Total Lbs)	2,799.15	7,747.78	14.90	382.21	321.12	651.92	6.52	1,536,293.12	30.55	1,537,056.80
	(PPH)	0.77	2.12	0.00	0.10	0.09	0.18	0.00	420.90	0.01	421.11
	(Tons)	1.40	3.87	0.01	0.19	0.16	0.33	0.00	768.15	0.02	768.53
	(TPY)	2.80	7.75	0.01	0.38	0.32	0.65	0.01	1536.29	0.03	1537.06

NOTE: Emissions show as "0.00" are <0.01.

NOTE: HAP assumed to be 1% of VOC emissions based on HAP to VOC ratio listed in AP-42 Tables 3.3-1 and 3.3-2.

NOTE: Material loads based on 6 days per week, for six months with 5 deliveries per day.

Feed Pad Area Emission Calculations

Road Emissions

VMT and Mean Vehicle Weight Calculations (Estimated Vehicle Traffic) ¹					
Vehicles Type	Percent of	Number of	Average	Length of	Vehicle
	Annual	Trips	Vehicle	Road	Miles
	Traffic	per Year	Weight	Round trip	per Year
	(%)	(trips/year)	(tons)	(miles)	(VMT/yr)
Dump Truck	45.45	3,650	19.5	1	3,650
Front-End Loader	0.00	0	17.5	0	0
Sweeper	0.00	0	4.5	0	0
Crane	0.00	0	30.0	0	0
Contractor Vehicles	4.55	365	4.0	1	365
Forklifts	4.55	365	6.5	1.0	365
Delivery Vehicles	45.45	3,650	40.0	1	3,650
JLG Manlifts	0.00	0	0.0	0	0
Total:					8,030

¹ Based on estimates of maximum annual rates.

Unpaved Road Emission Calculation:

Road Type	Uncontrolled Annual Average Emission Factor (lb/VMT)		
	PM	PM ₁₀	PM _{2.5}
Unpaved	0.27	0.03	0.00

Road Type	Controlled Hourly Emissions (lb/hr) ^{2,3}			Controlled Annual Emissions (tpy) ³		
	PM	PM ₁₀	PM _{2.5}	PM	PM ₁₀	PM _{2.5}
Unpaved	0.50	0.05	0.01	1.09	0.12	0.01

² Hourly emissions calculated based on annual emissions and hourly emissions based on 4,380 hours per year.

³ The control efficiency is applied 0% per TCEQ Guidance Document for Concrete Batch Plants (Draft, January 2001)

Control Type = none

Per U.S. EPA, AP-42, Section 13.2.2, Unpaved Roads, Equations 1a and 2 (November 2006):

$$\text{Emission Factor} \left(\frac{\text{lb}}{\text{VMT}} \right) = k \times (s/12)^a \times (W/3)^b \times \left(\frac{365-p}{365} \right)$$

Where:

VMT = Vehicle Miles Traveled
= 8,030 (see Estimated Vehicle Traffic table below)

k, a, b = AP-42 Empirical Constants (AP-42, Table 13.2.2-2)

Constants	PM	PM ₁₀	PM _{2.5}
k (lb/VMT)	4.9	1.5	0.15
a	0.7	0.9	0.9
b	0.45	0.45	0.45

s = silt content of unpaved road surface material (%)

6.0 % for Iron and Steel Production Plant Road (AP-42, Table 13.2.2-1)

W = Mean Vehicle Weight (tons)

= Σ [Average Vehicle Weight (ton) * Percentage of Annual Traffic]

= 27.52 tons (see Estimated Vehicle Traffic table below)

p = number of days in a year with at least 0.01 inch of precipitation

60 days (AP-42, Figure 13.2.2-1)

From TCEQ Guidance

Control method	Control	Control
Watering	70%	0.30
Oiling	80%	0.20
Chemical foam	85%	0.15
Paved only - no maintenance	60%	0.40
Paved and swept	90%	0.10
Paved and watered	95%	0.05
Paved and wet swept	98%	0.02
Paved and foamed	99%	0.01
Paved and vacuumed	99%	0.01
None	0%	0.00

Construction Emissions

Table 4.6-1

Total Construction Related Emissions - Pound Per Hour (PPH)

Source	CO	NOx	SO2	PM10	PM2.5	VOC	CO2e	PM
Construction Equipment	2.704733333	6.058766667		0.0113	0.213933333	0.213933333	0.7295	1056.865867 <0.01
Construction Worker Commuting	0.307053863	0.030093838	<0.01	<0.01	<0.01		0.03317739	55.17045115 <0.01
Material Delivery	0.766891202	2.122678098	<0.01		0.104715248	0.087977138	0.178607879	421.1114513 <0.01
Earthmoving Activities	<0.01	<0.01	<0.01		6.50887574	0.650887574 <0.01	<0.01	<0.01
Road Emissions	<0.01	<0.01	<0.01		0.025305644	<0.01	<0.01	0.238521873
Cement Plant	<0.01	<0.01	<0.01		2.6325	0.4275 <0.01	<0.01	8.82
Other VOC (Paint and Fuel)	<0.01	<0.01	<0.01	<0.01	<0.01		8.3015586 <0.01	<0.01
Total	3.778678399	8.211538602		0.0113	9.485329965	1.380298045	9.242843869	1533.147769

Sources: (CARB 2007), (WRAP 2006), (AP42 2006), (TCEQ 2001), and (TCEQ 2001b)

Construction Emissions

Table 4.6-2
Total Construction Related Emissions - Tons Per Year (TPY)

Source	CO	NOx	SO2	PM10	PM2.5	VOC	CO2e	PM
Construction Equipment	2.5316304	5.6710056	0.0105768	0.2002416	0.2002416	0.682812	990.70608	<0.01
Construction Worker Commuting	3.991700219	0.391219891	0.006957689	0.060182242	0.039097266	0.431306068	717.2158649	<0.01
Material Delivery	1.399576444	3.873887528	0.0074505	0.191105328	0.160558277	0.325959379	768.5283987	<0.01
Earthmoving Activities	<0.01	<0.01	<0.01	6.6	0.66	<0.01	<0.01	<0.01
Road Emissions	<0.01	<0.01	<0.01	0.05541936	0.005541936	<0.01	<0.01	0.522362901
Cement Plant	<0.01	<0.01	<0.01	2.6325	0.4275	<0.01	<0.01	8.82
Other VOC (Paint and Fuel)	<0.01	<0.01	<0.01	<0.01	<0.01	3.40547	<0.01	<0.01
Total	7.922907063	9.936113019	0.024984989	9.739448529	1.49293908	4.845547447	2476.450344	9.342362901

Sources: (CARB 2007), (WRAP 2006), (AP42 2006), (TCEQ 2001), and (TCEQ 2001b)