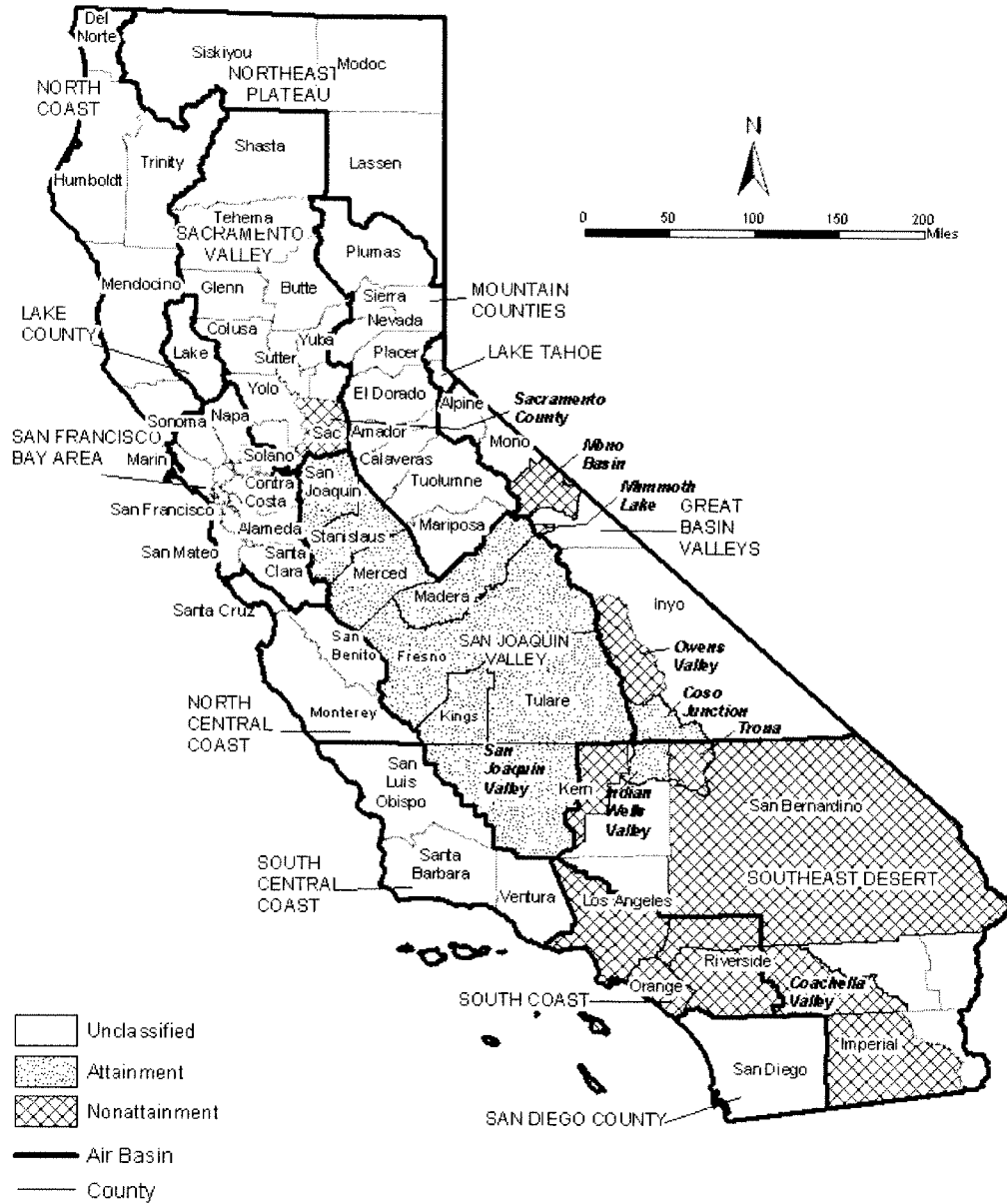
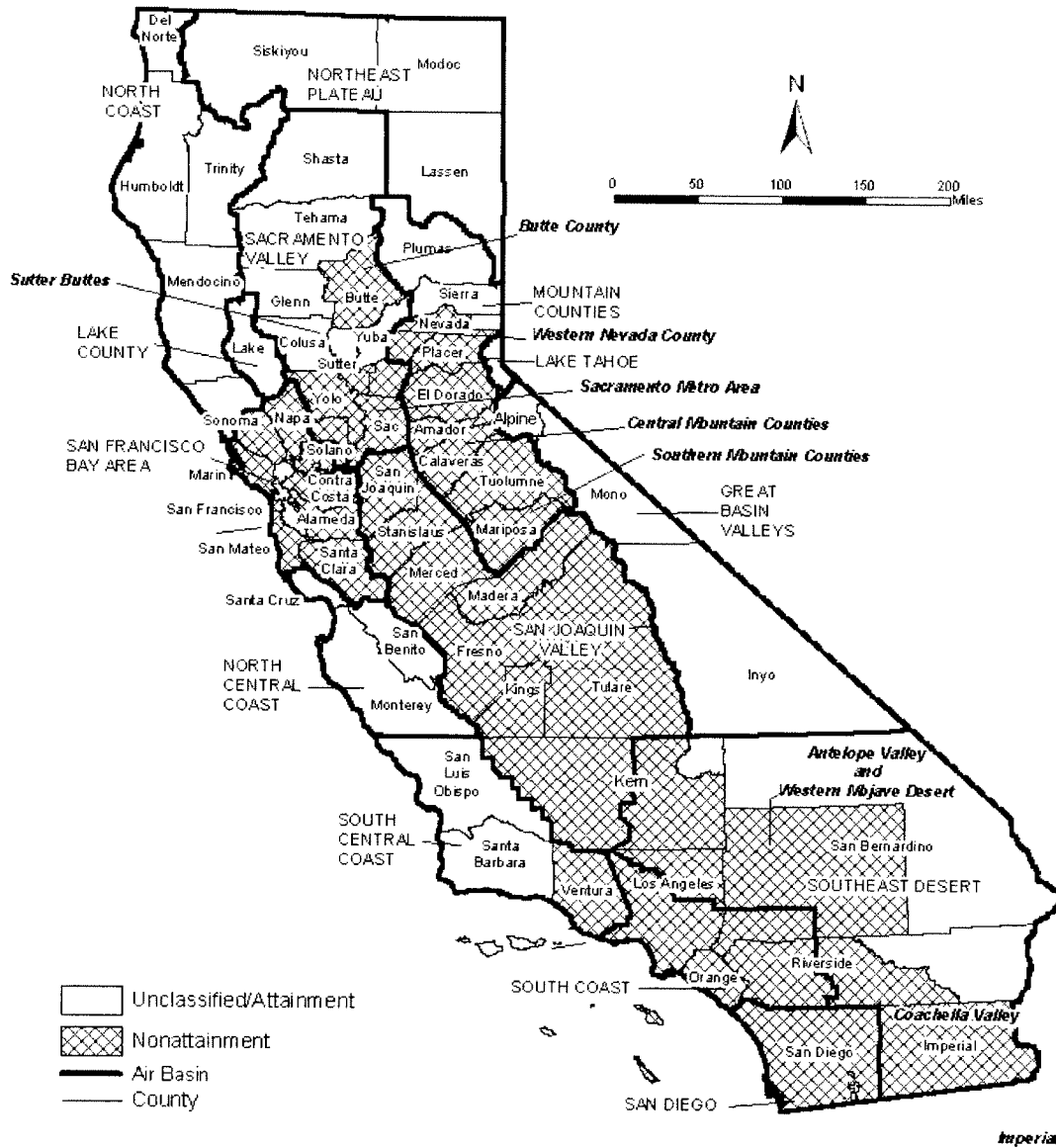


Area Designations for National Ambient Air Quality Standards PM10



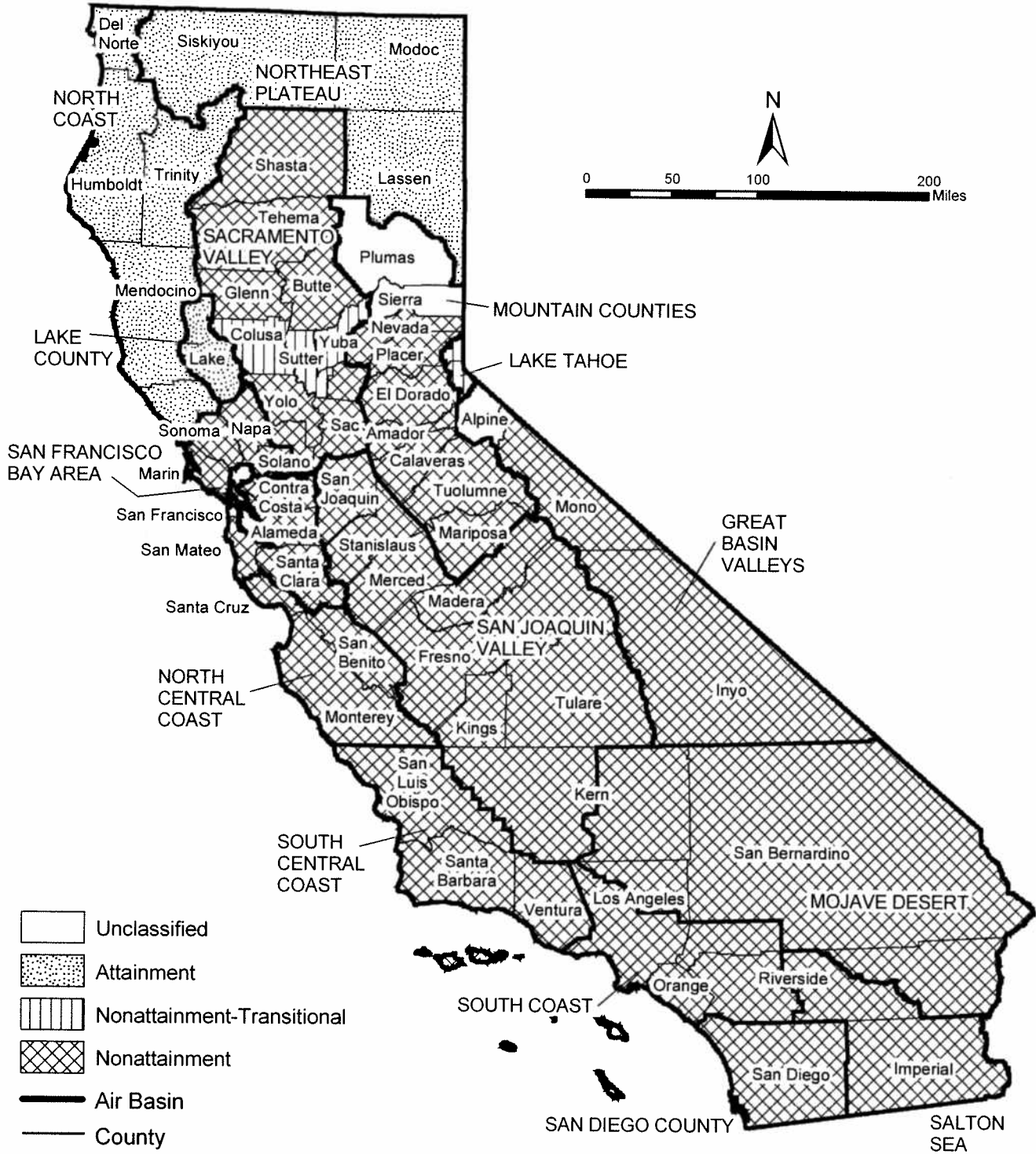
Source Date:
February 2011
Air Quality Data Branch, PTSD

Area Designations for National Ambient Air Quality Standards 8-HOUR OZONE



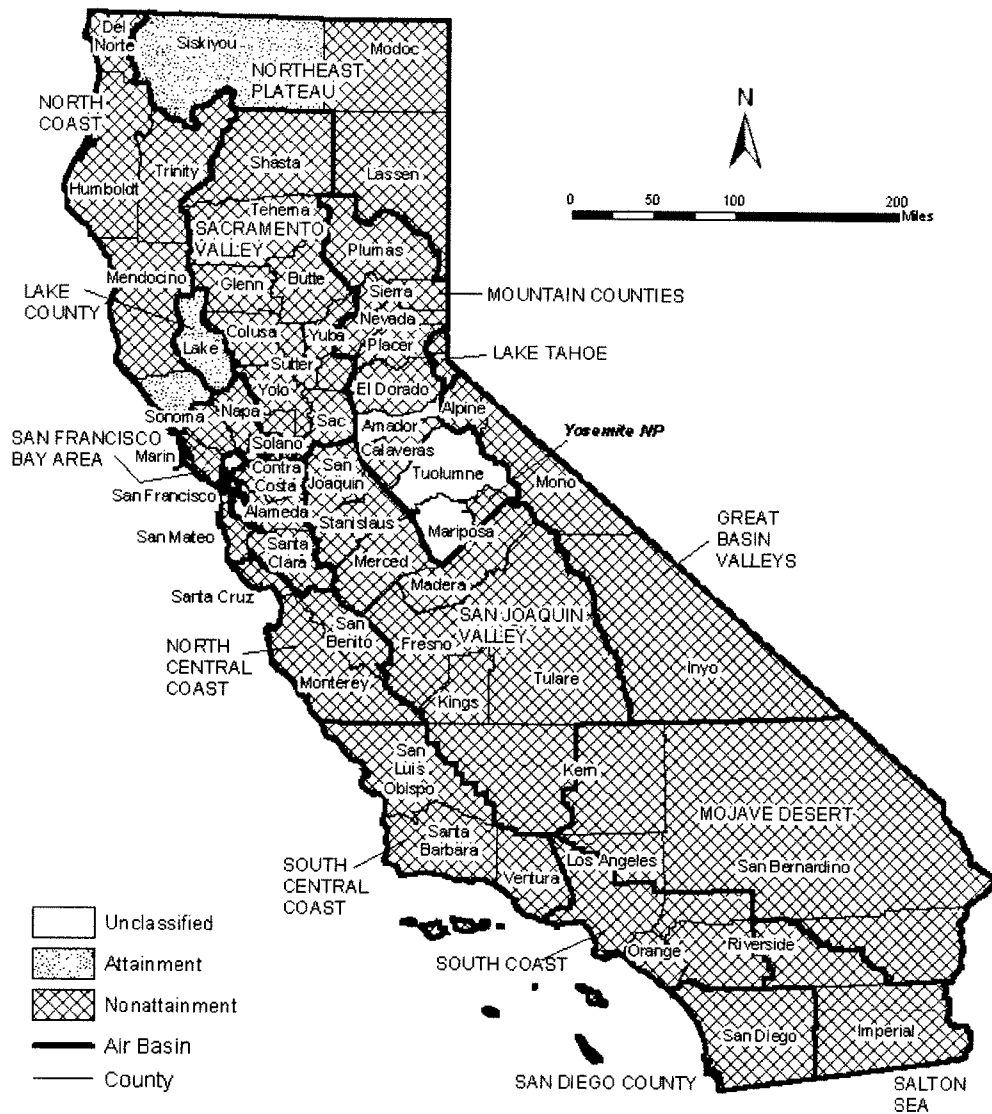
Source Date:
February 2011
Air Quality Data Branch, PTSD

2011 Area Designations for State Ambient Air Quality Standards OZONE



Source Date:
February 2011
Air Quality Data Branch, PTSD

2011 Area Designations for State Ambient Air Quality Standards PM10



Source Date:
February 2011
Air Quality Data Branch, PTSD

2011 Area Designations for State Ambient Air Quality Standards PM_{2.5}



Source Date:
February 2011
Air Quality Data Branch, PTSD

**INFORMATION
FOR
PM10 EMISSIONS
FROM
FUGITIVE DUST CREATED DURING
CONSTRUCTION AND OPERATION OF THE PROJECT**

TABLE A9 - 9

ESTIMATING PM10 EMISSIONS FROM FUGITIVE DUST
 (CONSTRUCTION SITES, AND OPERATION OF COMMERCIAL, RESIDENTIAL FACILITIES AND INDUSTRIES
 SUCH AS QUARRIES, ROCK-CRUSHING, ETC.)
 (POUNDS PER DAY)

SOURCE TYPE	SOURCE-RELATED ESTIMATIONS	MULTIPLY BY	EMISSION FACTORS (F)	REFERENCE TO TABLES*****	EMISSIONS (Pounds/Day) (E)
Passenger Vehicle/ On Paved Roadways (without street cleaning)	<u> </u> VMT per DAY (Use Table A9 - 9 - A)	X	<u> </u> , or (0.33 lbs/mile)*	Table A9 - 9 - B	<u> </u>
Passenger Vehicle/ On Paved Roadways (with street cleaning)	<u> </u> VMT per DAY (Use Table A9 - 9 - A)	X	<u> </u> , or (0.018 lbs/mile)*	Table A9 - 9 - B	<u> </u>
Passenger Vehicle/ On Unpaved Roads	<u> </u> VMT per DAY (Use Table A9 - 9 - A)	X	<u> </u> , or (5.56 lbs/mile)*	Table A9 - 9 - D	<u> </u>
Trucks on Paved Roadways (without street cleaning)	<u> </u> VMT per DAY (Use Table A9 - 9 - A)	X	<u> </u> , or (2.00 lbs/mile)*	Table A9 - 9 - C	<u> </u>
Trucks on Paved Roadways (with street cleaning)	<u> </u> VMT per DAY (Use Table A9 - 9 - A)	X	<u> </u> , or (0.40 lbs/mile)*	Table A9 - 9 - C	<u> </u>
Trucks On Unpaved Roads	<u> </u> VMT per DAY (Use Table A9 - 9 - A)	X	<u> </u> , or (23.0 lbs/mile)*	Table A9 - 9 - D	<u> </u>

TABLE A9 - 9 (Cont.)

ESTIMATING PM10 EMISSIONS FROM FUGITIVE DUST
(POUNDS PER DAY)

SOURCE TYPE	SOURCE-RELATED ESTIMATIONS	MULTIPLY BY	EMISSION FACTORS (F)	REFERENCE TO TABLES*****	EMISSIONS (Pounds/Day) (E)
Passenger Vehicle/ Paved Parking Lots (without street cleaning)	_____ # of Vehicles per Day	X	_____ x A** lbs/vehicle; or (0.33 x A** lbs/vehicle)*	Table A9 - 9 - B	_____
Passenger Vehicle/ Paved Parking Lots (with street cleaning)	_____ # of Vehicles per Day	X	_____ x A** lbs/vehicle; or (0.018 x A** lbs/vehicle)*	Table A9 - 9 - B	_____
Passenger Vehicle/ Unpaved Parking Lots	_____ # of Vehicles per Day	X	_____ x A** lbs/vehicle; or (5.56 x A** lbs/vehicle)*	Table A9 - 9 - D	_____
Trucks/Paved Parking Lots (without street cleaning)	_____ # of Vehicles per Day	X	_____ x A** lbs/vehicle; or (2.00 x A** lbs/vehicle)*	Table A9 - 9 - C	_____
Trucks/Paved Parking Lots (with street cleaning)	_____ # of Vehicles per Day	X	_____ x A** lbs/vehicle; or (0.40 x A** lbs/vehicle)*	Table A9 - 9 - C	_____
Trucks Vehicles/ Unpaved Parking Lots	_____ # of Vehicles per Day	X	_____ x A** lbs/vehicle; or (23.0 x A** lbs/vehicle)*	Table A9 - 9 - D	_____

TABLE A9 - 9 (Cont.)
ESTIMATING PM10 EMISSIONS FROM FUGITIVE DUST
(POUNDS PER DAY)

SOURCE TYPE	SOURCE-RELATED ESTIMATIONS	MULTIPLY BY	EMISSION FACTORS (F)	REFERENCE TO TABLES*****	EMISSIONS (Pounds/Day) (E)
Open Storage Piles	___ Acres of Area Covered by Storage Piles per Day	X	___, or (85.6 lbs/day/acre)*	Table A9 - 9 - E	___
	- OR -				
Dirt/Debris Pushing Operations	___ Square Feet of Area Covered by Storage Piles per Day	X	___, or (1.97 lbs/day/ 1000 square feet)*	Table A9 - 9 - E	___
	___ # of Bulldozers x ___ Hours of Operation per Day	X	___, or (21.8 lbs/hour)*		
Storage Pile Filling or Truck Dumping	___ Tons of Material Handled per Day	X	___, or (0.009075 lbs/ton)*	Table A9 - 9 - G	___
	___ Tons of Materials Handled per Day	X	___, or (0.02205 lbs/ton)*		
Demolition	___ Cubic Feet of building volume Demolished	X	___, or (0.00042 lbs PM10/ cubic feet of building volume)*	Table A9 - 9 - H	___

TABLE A9 - 9 (Cont.)

ESTIMATING PM10 EMISSIONS FROM FUGITIVE DUST
(POUNDS PER DAY)

SOURCE TYPE	SOURCE-RELATED ESTIMATIONS	MULTIPLY BY	EMISSION FACTORS (F)	REFERENCE TO TABLES***	EMISSIONS (Pounds/Day) (E)
Graded Surface	____ Acres of Area Graded	X	$\frac{N/A}{(26.4 \text{ lbs/Day/Acre})^*}$	EPA MRI Report	_____
Top Soil Removal (15 Cubic Meter Pan Scraper) Earthmoving (Cut and Fill Operation)	____ VMT per DAY (Table A9 - 9 - A)	X	$\frac{N/A}{(20.0 \text{ lbs/mile})^*}$	EPA MRI Report	_____
(15 Cubic Meter Pan Scraper) Dirt Hauling w/Truck	____ VMT per DAY (Table A9 - 9 - A)	X	$\frac{N/A}{(4.3 \text{ lbs/mile})^*}$	EPA MRI Report	_____
	____ VMT per DAY (Table A9 - 9 - A)	X	$\frac{N/A}{(10.0 \text{ lbs/mile})^*}$	EPA MRI Report	_____

* Default value

Example: Estimated Value, or Estimate Emission Factors Using Project Specific Data and Appropriate Tables

Default Value Use this value instead of estimating project specific emission factor

** $A = (L + W) \times C$

where,

L = Length of the parking lot in feet

W = Width of the parking lot in feet

C = 0.000189, a conversion factor to convert feet to miles

Note If value of (L + W) is unknown, use the following methodology to best estimate that value: Multiply the width of a carspace by 3.0 and add it to the length of that carspace. Multiply the addition by number of cars estimated for that parking lot or a project. For a normal size passenger carspace, width is 10 ft and length is 20 ft; for a compact size passenger carspace, width is 7 ft and length is 15 ft.

Thus, for a normal size passenger carspace, $A = (((10 \times 3) + (20)) \times \# \text{ of normal size vehicles or car spaces}) \times 0.000189$; and for a compact size passenger carspace, $A = (((7 \times 3) + (15)) \times \# \text{ of compact size vehicles or car spaces}) \times 0.000189$

Parking Space Default Values:

(For project-specific data, consult with city planners or environmental documents)

TABLE A9 - 9 (Cont.)

**ESTIMATING PM10 EMISSIONS FROM FUGITIVE DUST
(POUNDS PER DAY)**

- 1 parking space per 300 sq. ft. of commercial construction.
- 1 parking space per 1000 sq. ft of industrial park, warehouse-type construction.
- 1 parking space per 500 sq. ft of industrial manufacturing-type construction.
- 2 car spaces/family unit of single-family housing construction.
- 1 car space/1 bdrm unit of multi-family housing construction.
- 2 car spaces/2 or more bdrm units of multi-family housing construction.

*** Tables with examples to estimate emissions and project specific emission factors

TABLE A9 - 9 - A
ESTIMATING VEHICLE MILES TRAVELED FOR DUST EMISSIONS

$$V = W \times (X/Y) \times Z$$

This formula can also be used for estimating vehicle miles traveled (VMT) for Table A9 - 5 of this Handbook
 Where,

- V = Vehicle Miles Traveled or VMT (*Use this VMT to estimate fugitive dust and PM10 from fugitive on roads in Table A9 - 9).*
- W = Traveled Distance or Trip Length in miles (*For unpaved haul road, please see Example - 1 for unpaved country road, see Example - 2.*)
- X = Number of vehicles (*See environmental document or analysis for Tables 9 - 5 and 9 - 17).*
- Y = One Hour
- Z = Travel times in hours (*See environmental document or analysis for Tables 9 - 5 and 9 - 17)*)

EXAMPLE - 1

EXAMPLE FOR AN UNPAVED HAUL ROAD
 (Estimated VMT = 9,000 with the following input assumptions)
 (Please do not copy these assumptions, use the project specific data)

Input Example	Input Examples
W = Distance	5 miles
X = Number of Vehicles per hour	150
Z = Hours of Dust-Causing Activity	12

EXAMPLE - 2

EXAMPLE FOR AN UNPAVED COUNTRY ROAD
 (Estimated VMT = 13,500 with the following input assumptions)
 (Please do not copy these assumptions, use the project specific data)

Input Example	Input Examples
W = Distance	5 miles
X = Number of Vehicles per hour	150
Z = Hours of Dust-Causing Activity	18

Note In above two examples hours of dust-causing activities was changed; therefore, VMT was changed from 9,000 to 13,500 miles. Use project specific estimates.

TABLE A9 - 9 - B

**ESTIMATING EMISSIONS FROM PASSENGER VEHICLE TRAVEL
ON PAVED ROADS**

E^* = $V \times F$ (without street cleaning); or,

E^{**} = $V \times G$ (with street cleaning and is dependent on type of road)

Where,

- E^* = Emissions for passenger vehicles on paved roads and paved parking lots without street cleaning.
 - V = Vehicle miles Traveled (*See Table A9 - 9 - A to estimate VMT associated with passenger vehicles.*)
 - F = Default Emission Factor (*without street cleaning*) of 0.33 Pounds per Mile Traveled
 - E^{**} = Emissions for passenger vehicles on paved roads and paved parking lots with street cleaning.
 - G = Emission factors (*with street cleaning and is dependent on type of road*) from Sierra Research (*See Table A9 - 9 - B - 1*)
-

TABLE A9 - 9 - B - 1

**PAVED ROAD EMISSION FACTORS - PASSENGERS CARS WITH STREET
CLEANING**
(Pounds of PM10/Vehicle Mile Traveled)

Road Type	G (lb/VMT)
Local Streets	0.018
Collector Streets	0.013
Major Streets/Highways	0.0064
Freeways	0.00065

TABLE A9 - 9 - C
ESTIMATING EMISSIONS FROM TRUCK TRAVEL
ON PAVED ROADS

$E = V \times F$

Where,

- E = Emissions for Truck Travel on paved roads and paved parking lots without street cleaning.
- V = Vehicle miles Traveled (*See Table A9 - 9 - A to estimate VMT associated with trucks.*)
- F = Emission Factor for Truck Travel on paved roads and paved parking lots without street cleaning.

$0.77 \times \{(G \times 0.35)^{0.3}\}$ in pounds per miles traveled

Where,

- G = Surface silt loading in ounces/square yards (*Please see Table A9 - 9 - C - 1 for the type of roads and the silt loading*)

TABLE A9 - 9 - C - 1
PAVED ROAD SILT LOADING (G) AND ROAD TYPE - TRUCK TRAVEL
(G = Ounces per square yard of road)

Road Type	G (oz/yd ²)
Construction sites (without cleaning)	8.85
Construction sites (with cleaning)	0.04
Industrial Sites (in operation)	2.95
Local Streets	0.04
Collector Streets	0.03
Major Streets/Highways	0.012
Freeway	0.00065

EXAMPLES

Examples of Estimating Emission Factor (F) for Truck on Local Road
(F = pounds per Vehicle Miles Traveled)

Truck on	F (lb/VMT)
Example 1 Local Road	$F = 0.77 \times \{(G = 0.04) \times 0.35\}^{0.3}$ = 0.214
Example 2 Construction Site (without cleaning)	$F = 0.77 \times \{(G = 8.85) \times 0.35\}^{0.3}$ = 1.081

TABLE A9 - 9 - D
ESTIMATING EMISSIONS FROM VEHICLE TRAVEL
ON UNPAVED ROADS

$E = V \times F$

Where,

- E* = Emissions for Vehicle Travel on unpaved roads and unpaved parking lots.
- V = Vehicle Miles Traveled (See Table A9 - 9 - A to estimate VMT associated with passenger vehicles.)
- F = Emission Factor for Vehicle Travel on unpaved roads and unpaved parking lots.
 $2.1 \times [G/12] \times [H/30] \times \{[J/3]^{0.7}\} \times \{[I/4]^{0.5}\} \times \{[365 - K]/365\}$ in pounds per miles traveled

Where,

- G = Surface silt loading in percent (Please see Table A9 - 9 - D - 1 for the type of road and the silt loading for that road)
- H = Mean vehicle speed in miles per hour (Please see Table A9 - 9 - D - 2 for the speed assumptions)
- I = Mean number of wheels on vehicles (Please see Table A9 - 9 - D - 3 for number of wheels corresponding to the mean vehicle weight)
- J = Mean vehicle weight in tons (Please see Table A9 - 9 - D - 3 for mean vehicle weight corresponding to the mean number of wheels)
- K = Mean number of days per year with at least 0.01 inches of precipitation (Please see Table A9 - 9 - D - 4 for number of days of precipitation for the project area)

TABLE A9 - 9 - D - 1
UNPAVED ROAD SILT LOADING AND ROAD TYPE
(G = Percent)

Road Type	G
Gravel Road	4.0
Sand/Gravel Plant Road	6.0
Mining Haul Road	8.0
Crushed Limestone Road	10.0
Mountain Roads	12.0
Stone Quarrying Plant Roads	14.0
Farm Road	16.0
Copper Smelting Plant	18.0
Coal Mine Haul Road (freshly Scraped)	24.0
City and County Road	28.0

TABLE A9 - 9 - D - 2
MEAN VEHICLE SPEEDS
(H = Miles per Hour)

Scenario Description	H
Recommended Maximum	15.0
Maximum Allowable	25.0
Worst-case	35.0

TABLE A9 - 9 - D - 3

MEAN NUMBER OF WHEELS (I) AND MEAN NUMBER WEIGHT (J) OF THE VEHICLE

Vehicle Type	Weight of the Vehicle (J)	Number of Wheels (I)
Autos, Light Duty Pick-up Trucks, & Vans	2,000 to 6,000	4
Light Duty Vans and Utility Vehicles	6,001 to 10,000	4 to 6
Motor Homes, Medium Duty Flat-bed Trucks and Multi-stop Trucks	10,001 to 16,000	6 to 8
Heavy-Duty Flat-bed Trucks and Delivery Vans	16,001 to 19,500	6 to 10
Light/Heavy duty garbage dump and ready mix Concrete Trucks, Heavy/Heavy duty fuel and Waste Dump Trucks	19,501 to 33,000	10
Tractor Trailer Trucks	33,001 or More	18 to 30

TABLE A9 - 9 - D - 4

**PRECIPITATION CONDITIONS AND NUMBER OF DAYS
(K = Number of Days)**

Number of Days	K
Worst-case desert/drought	2.0
Worst-case SCAB/drought	10.0
Average year for desert	18.0
Average year for SCAB	34.0
Average year for mountains	40.0

EXAMPLES

**Examples of Estimating Emission Factor (F) for Truck on Local Road
(F = pounds per vehicle miles traveled)**

Example 1 Truck to Pick-up Goods in Drought Conditions

$$(F = 2.1 \times [(G=28)/12] \times [(H=35)/30] \times [(J=(10,000 \text{ lbs}/2,000)/3)^{0.7}] \times [(I=6/4)^{0.5}] \times \{365 - (K=10)\}/365) = 9.73$$

Example 2 Truck on Haul Road in Drought Conditions

$$(F = 2.1 \times [(G=28)/12] \times [(H=12)/30] \times [(J=(70,000 \text{ lbs}/2,000)/3)^{0.7}] \times [(I=18/4)^{0.5}] \times \{365 - (K=2)\}/365) = 23.08$$

TABLE A9 - 9 - E

**ESTIMATING EMISSIONS FROM WIND EROSION OF STORAGE PILES
(Pounds/Day/Acre)**

$$E = (1.7 \times [G/1.5] \times [365-H]/235] \times [I/15]) \times J$$

Where,

- E = PM10 Emissions from wind erosion of storage piles in pounds per day per acre
- G = Silt content of aggregate in percent (*Please see Table A9 - 9 - E - 1 for the type of aggregate in storage pile and silt content.*)
- H = Number of Days with ≥ 0.25 mm (0.01 inch) of precipitation per year (*Please see Table A9 - 9 - E - 2 for number of days in the project area.*)
- I = Percentage of time that the unobstructed wind speed exceeds 12 miles per hour or 5.4 meters/second at mean pile height.
- J = Fraction of Total Suspended Particulates which is estimated at 0.5.

TABLE A9 - 9 - E - 1

**SILT CONTENT AND TYPES OF AGGREGATES IN ACTIVE STORAGE PILES
(G = Silt Content of Aggregate in Percent)**

Types of Aggregates	G
Limestones	0.5
Sinter	0.7
Crushed Limestones	1.5
Slag and Coke	5.0
Coal	6.0
Overburden	7.5
Blended Ore and Dirt	15.0
Flue Dust	18.0

TABLE A9 - 9 - E - 2

**PRECIPITATION CONDITIONS AND NUMBER OF DAYS
(H = Number of Days)**

Number of Days	H
Worst-case desert/drought	2.0
Worst-case SCAB/drought	10.0
Average year for desert	18.0
Average year for SCAB	34.0
Average year for mountains	40.0

EXAMPLE

Examples of Estimating Emissions (E) from a Storage Pile
(E = pounds per day per acre)

$$(E = \{1.7 \times [(G=15\% = 0.15)/1.5] \times \{(365 - (H=10))/235\} \times [(I = 100\% = 100.0)/15]\} \times \{J = 0.5\} = 0.86)$$

TABLE A9 - 9 - F

**ESTIMATING EMISSIONS FROM DIRT PUSHING OR BULLDOZING OPERATIONS
(Pounds/Day)**

$$E = ([0.45 \times (([G]^{1.5})/([H]^{1.4}))] \times I) \times J$$

Where,

- E = PM10 Emissions from Dirt Pushing (Bulldozer Type Operations)
- G = Silt content of aggregate in percent (*Please see Table A9 - 9 - F - 1 for the type of aggregate in storage pile and the silt content.*)
- H = Moisture Content of the surface material (*Please see Table A9 - 9 - F - 2 for the moisture content and soil condition.*)
- I = 2.2046; a conversion Factor to convert kilograms per hour to pounds per hour.
- J = Hours of Pushing Operation (*User provides the value for J; See environmental documents.*)

TABLE A9 - 9 - F - 1

**SILT CONTENT AND TYPES OF AGGREGATES IN ACTIVE STORAGE PILES
(G = Percent)**

Types of Dirt	G
Limestones	0.5
Sinter	0.7
Crushed Limestones	1.5
Slag and Coke	5.0
Coal	6.0
Overburden	7.5
Blended Ore and Dirt	15.0
Flue Dust	18.0

TABLE A9 - 9 - F - 2

**DIRT CONDITIONS AND MOISTURE CONTENT
(H = Percent)**

Dirt Conditions	H
Dry	2.0
Moist	15.0
Wet	50.0

EXAMPLE

Examples of Estimating Emissions (E) for Dirt Pushing Operations
(E = pounds per day)

$$(E = [((0.45 \times [(G=15\% = 15.0)^{1.5}]) / [(H=2.0\% = 2.0)^{1.4}]) \times I = 2.2046] \times [J=4 \text{ hours}] = 87.36)$$

TABLE 9 - 9 - G

**ESTIMATING EMISSIONS FROM DIRT PILING OR MATERIAL HANDLING
(Pounds/Day)**

$$E = [0.00112 \times \{ \{ [G/5]^{1.3} \} / \{ [H/2]^{1.4} \} \}] \times [I/J]$$

Where,

- E = PM10 Emissions from dirt piling or material handling to form a storage pile on ground
- G = Mean Wind speed in miles per hour (*user should provide this information in environmental documents, or use 12 miles per hour for daily maximum and 25 miles per hour for worst-case scenario.*)
- H = Moisture Content of the surface material (*Please see Table 9 - 9 - G - 1 for the moisture content and soil condition.*)
- I = Pounds of dirt handled or stocked in a storage pile per day (*for truck piling please see Table 9 - 9 - G - 2 for guidelines.*)
- J = 2,000; a conversion factor to convert pounds of dirt to tons of dirt

TABLE 9 - 9 - G - 1

**DIRT CONDITIONS AND MOISTURE CONTENT
(H = Percent)**

Dirt Conditions	H
Dry	2.0
Moist	15.0
Wet	50.0

TABLE 9 - 9 - G - 2

**MAXIMUM DIRT WEIGHT (I) THAT CAN BE STORED IN A TRUCK
(User should provide the value for H. For truck piling use the following for guidelines)**

Vehicle Type	Maximum Weight of the Dirt (I)
Light Duty Pick-up Trucks	(2,000 to 6,000) -* (Wt.** of Empty Truck)
Utility Vehicles	(6,001 to 10,000) - (Wt. of Empty Truck)
Medium Duty Flat-bed Trucks and Multi-stop Trucks	(10,001 to 16,000) - (Wt. of Empty Truck)
Heavy-Duty Flat-bed Trucks	(16,001 to 19,500) - (Wt. of Empty Truck)
Light/Heavy duty garbage dump and ready mix Concrete Trucks	(19,5001 to 33,000) - (Wt. of Empty Truck)
Heavy/Heavy duty waste dump trucks, Tractor Trailer Trucks	(33,001 or More) - (Wt. of Empty Truck)

* " - " = Minus sign or subtraction sign

** "Wt." = Weight

EXAMPLE

Example of Estimating Emissions (E) for Dirt Pushing Operations
(E = pounds per day)

$$(E = 0.00112 \times \{ \{ (G=25 \text{ mph})/5 \}^{1.3} \} / \{ \{ (H=2.0 \% = 0.02)/2 \}^{1.4} \} \}) \times (I = [10,000 \text{ lbs}/J = 2,000] \text{ tons}) = 28.63)$$

TABLE A9 - 9 - H
ESTIMATING EMISSIONS FROM BUILDING WRECKING
(Pounds/Day)

$$E = 0.00042 * x J$$

Where,

J = Building volume handled per day (*Use environmental documents for the following information*); or

$$J = (N \times O \times P) / Q$$

where,

N = Width of building in feet

O = Length of building in feet

P = Height of building in feet

Q = Number of days required to demolish a building

*** = Pounds of PM10 Per Cubic Feet**

EXAMPLE 1

Sample Calculation: PM10 Emissions After Implementation of One Mitigation Measure:

E = 10 lbs of unmitigated PM10 from trucks traveling on unpaved roads

C = 45% reduction from applying water 3 times daily

$$M^* = E \times C (1 - C) + G + H$$

$$M^* = 10 \times (1 - 0.45)$$

$$M^* = 5.5 \text{ lbs of remaining PM10 emissions}$$

EXAMPLE 2

Sample Calculation: PM10 Emissions After Implementation of Two Mitigation Measures:

E = 10 lbs of PM10 from unpaved roads

C = Measure 1 reduces 45% from applying water 3 times daily

D = Measure 2 reduces 40% from controlling traffic speeds

$$M^{**} = [E \times \{(1 - C) \times (1 - D)\}]$$

$$M^{**} = 10 \times \{(1 - 0.45) \times (1 - 0.40) + G + H\}$$

$$M^{**} = 3.3 \text{ lbs of remaining PM10 emissions}$$

TABLE A11 - 9 - A
(continued)

Emission Source	Mitigation Measure	Reduction Efficiency	Favorable Factors
Fugitive Dust from Roads	Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip.	40 - 70%*	Set up truck washing area on paved access road area so subsequent truck travel on unpaved roads can be eliminated
Fugitive Dust from Roads	Pave construction roads that have a traffic volume of more than 50 daily trips by construction equipment, or 150 total daily trips for all vehicles	92.5% (91% for trucks) 94% for Passenger Vehicles)	
Fugitive Dust from Roads	Pave construction access roads at least 100 feet onto the site from main road	92.5% (91% for trucks) (94% for Passenger Vehicles)	
Fugitive Dust from Roads	Pave construction roads that have a daily traffic volume of less than 50 vehicular trips.	92.5% (91% for trucks) (94% for Passenger Vehicles)	
Fugitive Dust from Roads	Apply water three times daily, or apply non-toxic soil stabilizers** according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces	45%-85%*	Use non-toxic chemical stabilizers that are formulated for use on unpaved road surfaces
Fugitive Dust from Roads	Traffic speeds on all unpaved roads to be reduced to 15 mph or less	40%-70%*	Effective traffic control or signage

* Use the lowest value if better information is not known. If higher than lowest value is used, please provide the supporting analysis and data in the environmental documentation.

** If watering is needed for soil binders on ground covers, additional percentage reductions should not be taken for watering.

TABLE A11 - 9 - A

CONTROL EFFICIENCY OF PM10 MITIGATION MEASURES
Percentage Efficiencies Within the Emission Source Category (C)

Emission Source	Mitigation Measure	Reduction Efficiency	Favorable Factors
Fugitive Dust/ Construction	Apply non-toxic chemical soil** stabilizers according to manufacturers' specifications, to all inactive construction areas (previously graded areas inactive for ten days or more)	30% - 65% *	Stabilizers applied in sufficient concentration to provide erosion protection for at least one year
Fugitive Dust/ Construction	Replace ground cover** in disturbed areas as quickly as possible	15% - 49% *	Small, densely planted ground cover
Fugitive Dust/ Construction	Enclose, cover, water twice daily, or apply non-toxic soil binders**, according to manufacturers' specifications, to exposed stock piles (i.e., gravel, sand, dirt) with 5% or greater silt content	30% - 74% *	Automatic water mist or sprinkler systems should be installed in areas with stock piles
Fugitive Dust/ Construction	Water active sites at least twice daily	34% - 68% *	Water at sufficient frequency to keep soil moist enough ♦ so visible plumes are eliminated. ♦ Water content is greater than 12%
Fugitive Dust/ Construction	Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph	NQ	
Fugitive Dust/ Construction	Monitor for particulate emissions according to District-specified procedures	NQ	
Fugitive Dust from Roads	All trucks hauling, dirt, sand, soil, or other loose materials are to be covered, or should maintain at least two feet of freeboard in accordance with the requirements of CVC section 23114, (freeboard means vertical space between the top of the load and top of the trailer)	7% - 14% *	Tightly secured covering to truck
Fugitive Dust from Roads	Sweep streets once a day if visible soil materials are carried to adjacent streets (recommend water sweepers with reclaimed water)	25% - 60% *	Sweep streets immediately after period of heaviest vehicular track-out activity

(Continued)