



North Coast Unified Air
Quality Management District
707 L Street
Eureka, CA 95501
(707) 443-3093

HOT MIX ASPHALT PLANT FORM 1310

Form 1300 must also accompany all submittals

Part I - Facility Information

Section I-A: Production Status

What is the facility's maximum production rate in tons?

Current	Hourly:	Daily:	Annually:
Proposed	Hourly:	Daily:	Annually:

Section I-B: Proposed Operating Schedule

Facility maximum operating ($\frac{\text{hours}}{\text{day}}$):	($\frac{\text{days}}{\text{week}}$):	($\frac{\text{weeks}}{\text{year}}$):	($\frac{\text{hours}}{\text{year}}$):
Facility's maximum daily operating schedule:	Start:	<input type="checkbox"/> AM <input type="checkbox"/> PM	End: <input type="checkbox"/> AM <input type="checkbox"/> PM
Month and year of anticipated startup of new or modified facility:			

Section I-C: Plant Type

What type of plant will be used? Batch mix _____ Drum mix _____

Section I-D: Equipment

List number of: Screens _____ Conveyors _____ Generators/Engines _____ Burners/Dryers _____ Silos _____ Pug Mills _____

Section I-E: Haul Road

What is the haul road length from the asphalt plant to the nearest public road? _____

Complete Table II-A and Table II-B of this application.

Section I-F: Dust Control

Unpaved roads: water base coarse surfactant paving sweeping other _____

Track out: (check all to be used): grizzly tire washing 50 ft of paving wet sweeping HEPA vacuum

SECTION I-G: Emissions Calculations

Complete Part II Tables where applicable. Also attach calculations for dryer.

AQMD USE ONLY	TRACKING #	SIC/SCC CODES	PERMIT REVIEW	ENFORCEMENT REVIEW
		/		
\$	FEE SCHEDULE:	CHECK/MONEY ORDER	AMOUNT	\$
		#		

Part II – Emissions Calculations

Table II-A: PM Road Emissions [AP-42, Fifth Edition, Volume I, CHAPTER 13, Miscellaneous Sources, 13.2.2 Unpaved Roads (Supplement E)]

Variable →	T	L	VMT	W	E*	UC	EF	PTE
Road Segment	Average Number of Round Trips per Hour	One way road length (miles)	Vehicle Mile Traveled per Hour (miles/hr)	Average Vehicle Weight (Loaded truck + Empty truck) / 2 (tons)	PM Emission Rate (lb/VMT)	PM Emission Rate Uncontrolled (lb/hr)	RoadControl Efficiency Factor (Table II-C)	Hourly PM PTE Controlled (lb/hr)
PM			$2 \times T \times L = \text{VMT}$		$2.77 \times W^{0.5} = E^*$	$\text{VMT} \times E = \text{UC}$		$\text{UC} \times \text{EF} = \text{PTE}$
PM			$2 \times T \times L = \text{VMT}$		$2.77 \times W^{0.5} = E^*$	$\text{VMT} \times E = \text{UC}$		$\text{UC} \times \text{EF} = \text{PTE}$
PM			$2 \times T \times L = \text{VMT}$		$2.77 \times W^{0.5} = E^*$	$\text{VMT} \times E = \text{UC}$		$\text{UC} \times \text{EF} = \text{PTE}$
							← Sum →	

Table II-B: PM10 Road Emissions [AP-42, Fifth Edition, Volume I, CHAPTER 13, Miscellaneous Sources, 13.2.2 Unpaved Roads (Supplement E)]

Variable →	T	L	VMT	W	E*	UC	EF	PTE
Road Segment	Average Number of Round Trips per Hour	One way road length (miles)	Vehicle Mile Traveled per Hour (miles/hr)	Average Vehicle Weight (Loaded truck + Empty truck) / 2 (tons)	PM10 Emission Rate (lb/VMT)	PM10 Emission Rate Uncontrolled (lb/hr)	RoadControl Efficiency Factor (Table II-C)	Hourly PM10 PTE Controlled (lb/hr)
PM10			$2 \times T \times L = \text{VMT}$		$0.805 \times W^{0.4} = E^*$	$\text{VMT} \times E = \text{UC}$		$\text{UC} \times \text{EF} = \text{PTE}$
PM10			$2 \times T \times L = \text{VMT}$		$0.805 \times W^{0.4} = E^*$	$\text{VMT} \times E = \text{UC}$		$\text{UC} \times \text{EF} = \text{PTE}$
PM10			$2 \times T \times L = \text{VMT}$		$0.805 \times W^{0.4} = E^*$	$\text{VMT} \times E = \text{UC}$		$\text{UC} \times \text{EF} = \text{PTE}$
							← Sum →	

*E = $k \times (s/12)^a \times (W/3)^b / (M_{dry}/0.2)^c$ = lbs/VMT, where k, a, b, and c are empirical constants, E = size-specific emission factor (lb/VMT), s = surface material silt content (%), W = mean vehicle weight (tons), M = surface material moisture content (%), M_{dry} = 0.2%, AP-42, Section 13.2.2 (9/98) Equations 1 & 2

Table II-C: Unpaved Roads Control Methods and Control Factors

Control Method	Efficiency (Eff.)	Efficiency Factor (EF)	Control Method	Efficiency (Eff.)	Efficiency Factor (EF)
Base Course <u>or</u> Watering	60%	0.40	Base Course <u>and</u> Surfactants	90%	0.10
Base Course <u>and</u> Watering	80%	0.20	Paved <u>and</u> Swept	95%	0.05

Table II-D: Emissions to Atmosphere (After Control Measures) (Use additional sheets if necessary)

Unit No.	Control Equipment		PM	PM10	NOx	CO	VOC	SO2	HAPS	Estimation Method
	Type	Manufacturer & Model No.	(lbs/hr) (tons/yr)	(lbs/hr) (tons/yr)	(lbs/hr) (tons/yr)	(lbs/hr) (tons/yr)	(lbs/hr) (tons/yr)	(lbs/hr) (tons/yr)	(lbs/hr) (tons/yr)	
Dryer										Manufacturer ____ AP-42 ____ Test ____
Gen/Eng No. 1										Manufacturer ____ AP-42 ____ Test ____
Gen/Eng No. 2										Manufacturer ____ AP-42 ____ Test ____
Screens: Fill in the sum of the screen processing rates and the annual operating hours, then solve.			lb/hr	PM(lb/hr) = 0.001764(lb/ton) × _____ (ton/hr) (sum of screen process rates)						AP42 - 11.19 1/1995
			ton/yr	PM(ton/yr) = 0.0005(ton/lb) × _____ (lb/hr) × _____ (hr/yr) (PM(lb/hr)) (hours per year)						
Conveyors (Transfer): Fill in the sum of the transfer conveyor processing rates and the annual operating hours, then solve.			lb/hr	PM(lb/hr) = 0.0001(lb/ton) × _____ (ton/hr) (sum of conveyor process rates)						AP42 - 11.19 1/1995
			ton/yr	PM(ton/yr) = 0.0005(ton/lb) × _____ (lb/hr) × _____ (hr/yr) (PM(lb/hr)) (hours per year)						
Road Fill in sum of PTE (lb/hr) (from Table II-A), annual operating hours, and then solve.			lb/hr	PM(lb/hr) = _____ (lb/hr) (sum of PTE, from Table III-A)						AP42 - 13.2.2 12/2003
			ton/yr	²PM(ton/yr) = 0.0005(ton/lb) × _____ (lb/hr) × _____ (hr/yr) (PM(lb/hr)) (hours per year)						
Aggregate Handling: fill in the plant capacity (ton/hr), annual operating hours, and then solve.			lb/hr	¹PM(lb/hr) = 0.01 (lb/ton) × _____ (ton/hr) (process rate)						AP42 - 13.2.4 1/1995
			ton/yr	PM(ton/yr) = 0.0005(ton/lb) × _____ (lb/hr) × _____ (hr/yr) (PM(lb/hr)) (hours per year)						
TOTALS: PM lbs/hr _____ PM tons/yr _____										

¹PM10 (lb/hr) = k x (0.0032) x (U/5)^{1.3} / (M/2)^{1.4} x (plant capacity), AP-42, 1/95, Section 13.2.4 where U = 15 mph and M = 2%.

Table II-E: Emissions to Atmosphere (After Control Measures) (Use additional sheets if necessary)

	PM10	Calculation	Estimation Method
	(lbs/hr)		
	(tons/yr)		
Screens: Fill in the sum of the screen processing rates and the annual operating hours, then solve.	$\frac{\text{lb}}{\text{hr}}$	$\text{PM10(lb/hr)} = 0.00084(\text{lb/ton}) \times \frac{\text{_____} (\text{ton/hr})}{(\text{sum of screen process rates})}$	AP42 - 11.19 1/1995
	$\frac{\text{ton}}{\text{yr}}$	$\text{PM10(ton/yr)} = 0.0005(\text{ton/lb}) \times \frac{\text{_____} (\text{lb/hr})}{(\text{PM(lb/hr)})} \times \frac{\text{_____} (\text{hr/yr})}{(\text{hours per year})}$	
Conveyors (Transfer): Fill in the sum of the transfer conveyor processing rates and the annual operating hours, then solve.	$\frac{\text{lb}}{\text{hr}}$	$\text{PM10(lb/hr)} = 0.000048(\text{lb/ton}) \times \frac{\text{_____} (\text{ton/hr})}{(\text{sum of conveyor process rates})}$	AP42 - 11.19 1/1995
	$\frac{\text{ton}}{\text{yr}}$	$\text{PM10(ton/yr)} = 0.0005(\text{ton/lb}) \times \frac{\text{_____} (\text{lb/hr})}{(\text{PM(lb/hr)})} \times \frac{\text{_____} (\text{hr/yr})}{(\text{hours per year})}$	
Road Fill in sum of PTE (lb/hr) (from Table II-B), annual operating hours, and then solve.	$\frac{\text{lb}}{\text{hr}}$	$\text{PM10(lb/hr)} = \frac{\text{_____} (\text{lb/hr})}{(\text{sum of PTE, from Table III-B})}$	AP42 - 13.2.2 12/2003
	$\frac{\text{ton}}{\text{yr}}$	$\text{PM10(ton/yr)} = 0.0005(\text{ton/lb}) \times \frac{\text{_____} (\text{lb/hr})}{(\text{PM(lb/hr)})} \times \frac{\text{_____} (\text{hr/yr})}{(\text{hours per year})}$	
Aggregate Handling: fill in the plant capacity (ton/hr), annual operating hours, and then solve.	$\frac{\text{lb}}{\text{hr}}$	$^{1,2}\text{PM10(lb/hr)} = 0.01 (\text{lb/ton}) \times \frac{\text{_____} (\text{ton/hr})}{(\text{process rate})}$	AP42 - 13.2.4 1/1995
	$\frac{\text{ton}}{\text{yr}}$	$^2\text{PM10(ton/yr)} = 0.0005(\text{ton/lb}) \times \frac{\text{_____} (\text{lb/hr})}{(\text{PM(lb/hr)})} \times \frac{\text{_____} (\text{hr/yr})}{(\text{hours per year})}$	
TOTALS: PM 10 lbs/hr _____ PM tons/yr _____			

¹PM10 (lb/hr) = k x (0.0032) x (U/5)^{1.3} / (M/2)^{1.4} x (plant capacity), AP-42, 1/95, Section 13.2.4 where U = 15 mph and M = 2%.

²PM emission factor divided by 2.1

Table II-G(a): DIESEL Small (up to 600 hp) Generator/Engine Emissions to Atmosphere (Uncontrolled)

Poll.	Emissions	Calculation (Emission Factors for Industrial Diesel Engines, AP-42, 10/96 Table 3.3-1 for engines up to 600 hp)
PM	$\frac{\text{lb}}{\text{hr}}$	$\text{PM lb/hr} = 0.005 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{PM tons/yr} = \text{lb/hr} \times \frac{\text{hours per year}}{2000}$
PM10	$\frac{\text{lb}}{\text{hr}}$	$\text{PM10 lb/hr} = 0.002 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{PM10 tons/yr} = \text{lb/hr} \times \frac{\text{hours per year}}{2000}$
NOx	$\frac{\text{lb}}{\text{hr}}$	$\text{NOx lb/hr} = 0.031 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{NOx tons/yr} = \text{lb/hr} \times \frac{\text{hours per year}}{2000}$
CO	$\frac{\text{lb}}{\text{hr}}$	$\text{CO lb/hr} = 0.007 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{CO tons/yr} = \text{lb/hr} \times \frac{\text{hours per year}}{2000}$
VOC	$\frac{\text{lb}}{\text{hr}}$	$\text{VOC lb/hr} = 0.002 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{VOC tons/yr} = (\text{lb/hr}) \times \frac{\text{hours per year}}{2000}$
SO2	$\frac{\text{lb}}{\text{hr}}$	$\text{SO}_2 \text{ lb/hr} = 0.002 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{SO}_2 \text{ tons/yr} = (\text{lb/hr}) \times \frac{\text{hours per year}}{2000}$

Table II-G(b): DIESEL Large (>600 hp) Generator/Engine Emissions to Atmosphere (Uncontrolled)

Poll.	Emissions	Calculation (Emission Factors for Industrial Diesel Engines, AP-42, 10/96 Table 3.4-1 for engines > 600 hp)
PM	$\frac{\text{lb}}{\text{hr}}$	$\text{PM lb/hr} = 0.001 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{PM tons/yr} = \text{lb/hr} \times \frac{\text{hours per year}}{2000}$
PM10	$\frac{\text{lb}}{\text{hr}}$	$\text{PM10 lb/hr} = 0.001 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{PM10 tons/yr} = \text{lb/hr} \times \frac{\text{hours per year}}{2000}$
NOx	$\frac{\text{lb}}{\text{hr}}$	$\text{NOx lb/hr} = 0.024 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{NOx tons/yr} = \text{lb/hr} \times \frac{\text{hours per year}}{2000}$
CO	$\frac{\text{lb}}{\text{hr}}$	$\text{CO lb/hr} = 0.006 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{CO tons/yr} = \text{lb/hr} \times \frac{\text{hours per year}}{2000}$
VOC	$\frac{\text{lb}}{\text{hr}}$	$\text{VOC lb/hr} = 0.001 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{VOC tons/yr} = (\text{lb/hr}) \times \frac{\text{hours per year}}{2000}$
SO2	$\frac{\text{lb}}{\text{hr}}$	$\text{SO}_2 \text{ lb/hr} = 0.0004 \times \frac{\text{sum of engine horsepower}}{\text{sum of engine horsepower}}$
	$\frac{\text{ton}}{\text{yr}}$	$\text{SO}_2 \text{ tons/yr} = (\text{lb/hr}) \times \frac{\text{hours per year}}{2000}$

Table II-G(c): GASOLINE Small (up to 600 hp) Generator/Engine Emissions to Atmosphere (Uncontrolled)

Poll.	Emissions	Calculation (Emission Factors for Industrial Diesel Engines, AP-42, 10/96 Table 3.3-1 for engines up to 600 hp)
PM	lb/hr	PM lb/hr = 0.002 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	PM tons/yr = lb/hr x $\frac{\text{hours per year}}{2000}$
PM10	lb/hr	PM10 lb/hr = 0.0007 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	PM10 tons/yr = lb/hr x $\frac{\text{hours per year}}{2000}$
NOx	lb/hr	NOx lb/hr = 0.011 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	NOx tons/yr = lb/hr x $\frac{\text{hours per year}}{2000}$
CO	lb/hr	CO lb/hr = 0.439 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	CO tons/yr = lb/hr x $\frac{\text{hours per year}}{2000}$
VOC	lb/hr	VOC lb/hr = 0.015 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	VOC tons/yr = (lb/hr) x $\frac{\text{hours per year}}{2000}$
SO2	lb/hr	SO ₂ lb/hr = 0.0006 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	SO ₂ tons/yr = (lb/hr) x $\frac{\text{hours per year}}{2000}$

Table II-G(d): DUAL FUEL Large (>600 hp) Generator/Engine Emissions to Atmosphere (Uncontrolled)

Poll.	Emissions	Calculation (Emission Factors for Industrial Diesel Engines, AP-42, 10/96 Table 3.4-1 for engines > 600 hp. Dual fuel assumes 95% natural gas and 5% diesel fuel).
PM	lb/hr	NO DATA
	ton/yr	NO DATA
PM10	lb/hr	NO DATA
	ton/yr	NO DATA
NOx	lb/hr	NOx lb/hr = 0.018 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	NOx tons/yr = lb/hr x $\frac{\text{hours per year}}{2,000}$
CO	lb/hr	CO lb/hr = 0.008 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	CO tons/yr = lb/hr x $\frac{\text{hours per year}}{2000}$
VOC	lb/hr	VOC lb/hr = 0.001 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	VOC tons/yr = (lb/hr) x $\frac{\text{hours per year}}{2000}$
SO2	lb/hr	SO ₂ lb/hr = 0.0002 x $\frac{\text{sum of engine horsepower}}{\text{hours per year}}$
	ton/yr	SO ₂ tons/yr = (lb/hr) x $\frac{\text{hours per year}}{2000}$