

General AO Controlled Emission Rates

Company: ABC Company
 Site: State of Utah
 Date: January 2014

AP-42	Section Name	PM ₁₀ tons/yr	SO ₂ tons/yr	NO _x tons/yr	CO tons/yr	Lead tons/yr	Fugitive		PM _{2.5} tons/yr	VOC tons/yr	HAP's tons/yr	CO ₂ eq. tons/yr	PM ₁₀ lb/hr	SO ₂ lb/hr	NO _x lb/hr	CO lb/hr	Lead lb/hr	Fugitive		PM _{2.5} lb/hr	VOC lb/hr	HAP's lb/hr	
							PM ₁₀ tons/yr	PM ₁₀ tons/yr										PM ₁₀ lb/hr	PM ₁₀ lb/hr				
	1.4 Heaters/Boilers	0.33	0.03	4.29	3.61	0.00		0.33	0.33	0.24	0.08	5,184	0.07	0.01	0.98	0.82	0.00		0.07	0.07	0.05	0.02	
	3.2 Pumpjack Engine	0.19	0.00	3.56	6.09	0.00		0.19	0.19	0.48	0.32	560	0.04	0.00	0.81	1.39	0.00		0.04	0.04	0.11	0.07	
	5.2 Truck Loading									7.85	1.14	377								1.79	0.26		
	7.1 Tank Working & Breathing Losses									0.21	0.03	10								0.05	0.01		
	V-B Tank Flashing Emissions									0.67	0.10	32								0.15	0.02		
	7.1a Glycol & Methanol Tanks									0.01	0.01	0								0.00	0.00		
	13.2.2 Unpaved Roads	0.04					0.04		0.00				0.01		0.14	0.74		0.01		0.00			
	13.5 Flares			0.60	3.24							26											
	Dehy Dehydrators									0.93	0.41	7								0.21	0.09		
	Pneu Pneumatic Devices									3.00	0.44	144								0.68	0.10		
	Fug Fugitive Emissions									0.16	0.02	8								0.04	0.01		
	Total PTE/Controlled Emissions	0.56	0.03	8.45	12.94	0.00	0.04	0.52	0.52	13.55	2.55	6,348	0.13	0.01	1.93	2.95	0.00	0.01	0.12	0.12	3.09	0.58	

General AO Uncontrolled Emission Rates

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AP-42	Section Name	PM ₁₀	SO ₂	NO _x	CO	Lead	Fugitive		PM _{2.5}	VOC	HAP's	CO ₂ eq.	PM ₁₀	SO ₂	NO _x	CO	Lead	Fugitive		VOC	HAP's		
		tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	PM ₁₀	PM ₁₀					lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr			lb/hr	lb/hr
	1.4 Heaters/Boilers	0.33	0.03	4.29	3.61	0.00			0.33	0.33	0.24	0.08	5,184	0.07	0.01	0.98	0.82	0.00		0.07	0.07	0.05	0.02
	3.2 Pumpjack Engine	0.19	0.00	12.63	6.09	0.00			0.19	0.19	0.48	0.32	560	0.04	0.00	2.88	1.39	0.00		0.04	0.04	0.11	0.07
	5.2 Truck Loading									18.97	2.76	912									4.33	0.63	
	7.1 Tank Working & Breathing Losses									10.53	1.53	506									2.40	0.35	
	V-B Tank Flashing Emissions									33.66	4.89	1,618									7.68	1.12	
	7.1a Glycol & Methanol Tanks									0.01	0.01	0									0.00	0.00	
	13.2.2 Unpaved Roads	0.04					0.04		0.00					0.01					0.01		0.00		
	13.5 Flares			0.00	0.00										0.00	0.00							
	Dehy Dehydrators									46.35	20.53	329									10.58	4.69	
	Pneu Pneumatic Devices									21.00	3.05	1,010									4.79	0.70	
	Fug Fugitive Emissions									7.75	1.13	372									1.77	0.26	
	Uncontrolled Emissions	0.56	0.03	16.93	9.70	0.00	0.04	0.52	0.52	138.98	34.30	10,491	0.13	0.01	3.87	2.21	0.00	0.01	0.12	0.12	31.73	7.83	

Unpaved Roads

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	PM ₁₀ tons/yr	SO ₂ tons/yr	NO _x tons/yr	CO tons/yr	Lead tons/yr	PM ₁₀ - F tons/yr	PM ₁₀ - NF tons/yr	PM _{2.5} tons/yr	VOC tons/yr	HAP's tons/yr	CO ₂ eq. tons/yr
Uncontrolled	0.04					0.04		0.00			
PTE/Controlled	0.04					0.04		0.00			

	PM ₁₀ lb/hr	SO ₂ lb/hr	NO _x lb/hr	CO lb/hr	Lead lb/hr	PM ₁₀ - F lb/hr	PM ₁₀ - NF lb/hr	PM _{2.5} lb/hr	VOC lb/hr	HAP's lb/hr
Uncontrolled	0.01					0.01		0.00		
PTE/Controlled	0.01					0.01		0.00		

	Uncontrolled		Controlled	
	lbs/hr	tons/year	lbs/hr	tons/year
Fugitive PM ₁₀	0.01	0.04	0.01	0.04
PM _{2.5}	0.00	0.00	0.00	0.00

	Annual	Daily
Usage (barrels) =	50,000	137.0
Usage (gallons) =	2,100,000	5,753.4
Weight (tons) =	8,762	24.0

*Average Truck can carry 240 bbl = 10,800 gallons = 42 tons

	Vehicle	Load	Total	Trips/Year #	Trips/Day #
	Weight (tons)	Weight* (tons)	Weight (tons)		
Truck	20	42	62	365	1

Unpaved Roads

$$E = k \left(\frac{s}{12} \right)^a \times \left(\frac{W}{3} \right)^b$$

AP-42 13.2.2.4 equation # 1a

$$E_{ext} = E \left[\frac{(365 - P)}{365} \right]$$

correction factor for "wet" days

- E = size-specific emission factor (lb/VMT)
- k, a, b = empirical constants
- 4.8 s = surface material silt content (%)
- W = mean vehicle weight (tons)
- S = mean vehicle speed (mph)
- M = Surface material moisture content (%)
- C = emission factor for 1980's vehicle fleet exhaust, brake wear, and tire wear.
- 60 P = number of "wet" days with at least 0.01 in of precipitation
- 0% Unpaved-Efficiency (%)

Control-Efficiency (%)	Size Range	k lb/VMT	Table 13.2.2-2				Table 13.2.2-4
			a	b	c	d	C lb/VMT
70% Basic Watering	PM _{2.5}	0.15	0.9	0.45	0.2	0.5	0.00036
75% Basic Watering and Road Base	PM ₁₀	1.5	0.9	0.45	0.2	0.5	0.00047
85% Chemical Suppressant and Watering							
90% Paving Road Surface with Sweeping and Watering							
95% Paving Road Surface plus Vacuum Sweeping and Watering							

Section of Road	Length of Road (feet)	Length of Road (miles)	1-way or 2-way Road	Average Weight (tons)	Uncontrolled EF lb/VMT		Yearly Distance (miles)	Annual Emissions (tons/year)			
					E ₁₀	E _{2.5}		Uncontrolled		Controlled	
								PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
1	300	0.056818	2	41	2.133013	0.213301	41.47727	0.036964	0.003696	0.036964	0.003696
								0.036964	0.003696	0.036964	0.003696

Daily Distance (miles)	Hourly Emissions (lb/hr) (based on a 24-hr average)			
	Uncontrolled		Controlled	
	PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
0.113636	0.008439	0.000844	0.008439	0.000844
	0.008439	0.000844	0.008439	0.000844