

SANTA BARBARA COUNTY APCD FORM-24

TABLE 1 - CONSTRUCTION EQUIPMENT UNCONTROLLED EMISSION FACTORS

CODE	TYPE	EMISSION FACTORS (g/hp-hr)					
		EXH. THC	ALDEHYDE	NOx	SOx	CO	PM
	<u>DIESEL</u>						
1	Track-type Tractor	0.75	0.17	11.00	0.85	2.15	0.69
2	Wheeled Tractor	1.76	0.28	11.00	0.85	7.34	1.27
3	Wheeled Dozer	0.37	0.16	11.00	0.87	2.28	0.41
4	Scraper	0.55	0.28	11.00	0.90	2.45	0.79
5	Motor Grader	0.36	0.12	11.00	0.87	1.54	0.63
6	Wheeled Loader	0.97	0.20	11.00	0.86	2.71	0.81
7	Track type Loader	1.11	0.10	11.00	0.85	2.26	0.66
8	Off-Highway Truck	0.37	0.22	11.00	0.89	2.28	0.50
9	Roller	0.97	0.20	11.00	1.00	6.03	0.78
10	Miscellaneous	1.01	0.20	11.00	0.93	4.60	0.90
11	Industrial	1.12	0.21	14.00	0.93	3.03	1.00
12	Marine Generator	0.94	0.00	11.71	0.71	2.55	0.82
13	Large Vessels	0.34	0.00	14.28	0.71	2.15	0.62
14	Small Vessels	0.44	0.00	9.78	0.71	1.96	0.82
15	Large Bore Engine	0.31	0.00	11.00	0.75	2.90	1.10
16	Small Bore Engine	1.02	0.00	14.00	0.75	3.03	1.00
	<u>GASOLINE</u>						
17	Gasoline Misc.	6.49	0.22	4.79	0.26	198.00	0.30
18	Fugitive Dust						10.91 lb/acre-hr

Notes:

- (a) Aldehydes include evaporative and crankcase hydrocarbons for gasoline.
- (b) Emission factor references cited in Table 2 and shown in Table 3.

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TABLE 2 - CONSTRUCTION EQUIPMENT CONTROLLED EMISSION FACTORS

CODE	TYPE	EMISSION FACTORS (g/hp-hr)					
		ROC	NOx	SOx	CO	PM10	REFS
	<u>DIESEL</u>						
1	Track-type Tractor	0.88	8.80	0.19	2.15	0.66	1,3,4,5
2	Wheeled Tractor	1.95	8.80	0.19	7.34	1.21	1,3,4,5
3	Wheeled Dozer	0.51	8.80	0.20	2.28	0.39	1,3,4,5
4	Scraper	0.80	8.80	0.20	2.45	0.75	1,3,4,5
5	Motor Grader	0.46	8.80	0.20	1.54	0.59	1,3,4,5
6	Wheeled Loader	1.12	8.80	0.19	2.71	0.76	1,3,4,5
7	Track type Loader	1.15	8.80	0.19	2.26	0.62	1,3,4,5
8	Off-Highway Truck	0.57	11.00	0.20	2.28	0.48	1,3,4,5
9	Roller	1.12	8.80	0.23	6.03	0.74	1,3,4,5
10	Miscellaneous	1.16	8.80	0.21	4.60	0.86	1,3,4,5
11	Industrial	1.27	11.20	0.21	3.03	0.95	2,3,4,5
12	Marine Generator	0.89	8.40	0.16	2.55	0.78	8
13	Large Vessels	0.32	8.57	0.16	2.15	0.59	8
14	Small Vessels	0.42	8.40	0.16	1.96	0.78	8
15	Large Bore Engine	0.29	8.40	0.19	2.90	1.05	8
16	Small Bore Engine	0.97	8.40	0.19	3.03	0.95	8
	<u>GASOLINE</u>						
17	Gasoline Misc.	6.13	4.79	0.26	198.00	0.30	1,4,5
18	Fugitive Dust					3.49 lb/acre-hr	6,7
19	Painting	16.63 lb/1000 sq ft-mil					9
20	Painting-Latex	25.10 lb/1000 sq ft-mil					9
21	Sandblasting					0.01 lb/ lb abrasive	10

Table Notes: (see Table 3 for notes to References).

1. Diesel

- (a) ROC equals uncontrolled exhaust THC times 0.95 (ROC/THC) plus aldehydes.
- (b) NOx equals uncontrolled 0.80 (codes 1-7 & 9-11) or times 0.6 (codes 12 through 16). Minimum NOx factor is 8.4 g/hp-hr. Off-highway trucks (code 8) not controlled.
- (c) SOx equals uncontrolled SOx times 0.227 (5/22) for codes 1 through 14 (Ref. 3) and uncontrolled SOx times 0.25 (5/20) for codes 15 and 16.
- (d) CO and PM equal uncontrolled factors
- (e) PM10 equals PM times 0.96 (Ref. 5).

2. Gasoline

- (a) THC equals uncontrolled exhaust THC plus aldehydes plus evaporative and crankcase hydrocarbons; Aldehydes column includes crankcase and evaporative HCs.
- (b) ROC equals uncontrolled exhaust THC times 0.91 (Ref. 4) plus aldehydes.
- (c) NOx, SOx, CO, and PM equal uncontrolled factors.
- (d) PM10 equals PM times .994 (Ref. 5).

3. Fugitive Dust: PM10 equals uncontrolled PM times 0.5 (Ref. 6) times 0.64 (Ref. 7)

4. NOx as NO2; SOx as SO2.

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TABLE 3 - CONSTRUCTION EQUIPMENT REFERENCES FOR EMISSION FACTORS

1. U.S. EPA, Compilation of Air Pollutant Emission Factors, Volume II: Mobile Sources; Tables II-7-1 (Diesel) and Table II-7-2 (Gasoline) (THC, NOx, SOx {see 3 below}, CO, and PM). Uncontrolled NOx factor for construction equipment set at 11 g/hp-hr per SBCAPCD.
2. U.S. EPA, 1993. Compilation of Air Pollutant Emission Factors (AP-42), Volume 1: Stationary Point and Area Sources (revised through Supplement F). Table 3.3-1 (THC, NOx, SOx {see 3 below}, CO, and PM).
3. SOx emission factors for diesel combustion were modified to reflect use of fuel having 0.05 pct. sulfur instead of 0.22 pct. in AP-42 and 0.20 pct. in Ref. 8 below. NOx and THC diesel factors adjusted to reflect injection timing retard, and high pressure fuel injectors on some engines. Overall average NOx reduction assumed was 20% for codes 1-7 & 9-11, 40% for codes 12 through 16, and no control for code 8.
4. California ARB, 1991. Identification of Volatile Organic Compound Species Profiles. Used to define VOC as non-methane portion of THC. Profiles 561 (Diesel - ROC = 0.95*THC) and 502 (Non-catalyst light-duty vehicles - ROC = 0.91*THC).
5. California ARB, 1988. Method used to Develop a Size-Segregated Particulate Matter Inventory (Draft). PM10 Fractions from Profiles 118 (Diesel - PM10 = 0.96*PM) and 117 (Gasoline - PM10 = 0.994*PM).
6. U.S. EPA, 1993. Same as Reference 2 above. Fugitive PM based on 1.2 tons per acre per month (Section 11.2.4) and 220 hours per month. Controlled factor assumes 50% credit for watering.
7. California ARB, 1988. Same as Reference 5 above. PM10 fraction is 0.64 based on Profile 391 - Road and Building Construction Dust.
8. Technical Support Document, Net Emission Increase, Entire Source Emissions, Installation and Operation, Santa Ynez Unit/Las Flores Canyon Oil and Stripping Gas Treating Facility and Transportation Terminal. Exxon Company, U.S.A., February 29, 1988, County of Santa Barbara Air Pollution Control District (Table 3.1-2). THC factor in Table 1 is Exxon ROC factor divided by 0.95 (see note 4 above). SOx factor in the Exxon TSD was based on a sulfur content of 0.20 wt pct.
9. SCAQMD, 1993. CEQA Air Quality Handbook. Table A9-13-B, High Solid Coatings and Water-Based Coatings, interpolated to APCD Rule 323 limit of 340 grams ROC/liter.
10. SCAQMD Permit Processing Manual, 1989, as cited in Platform Harmony PTO 9101.