

## **Combustion Default Emission Factors**

**(Revised December 2024)**

### **Criteria Pollutant Emission Factors**

#### **External Combustion Equipment (for all sizes)**

<b>Fuel Type (fuel unit)</b>	<b>Organic Gases (lb/unit)</b>	<b>Nitrogen Oxides (lb/unit)</b>	<b>Sulfur Oxides (lb/unit)</b>	<b>Carbon Monoxide (lb/unit)</b>	<b>Particulate Matter (lb/unit)</b>
Natural Gas (mmscf) / Boilers Only	5.50	100.00	0.60	84.00	7.60
Natural Gas (mmscf) / Other Equipment	7.00	130.00	0.60	35.00	7.50
LPG, Propane, Butane (1000 gal.)	0.26	12.80	4.60	3.20	0.28
Diesel/Distillate Oil (1000 gal.)	1.32	20.00	0.21	5.00	2.00

#### **Internal Combustion Engines (ICE) (for all sizes)**

<b>Fuel Type (fuel unit) / Engine Type*</b>	<b>Organic Gases (lb/unit)</b>	<b>Nitrogen Oxides (lb/unit)</b>	<b>Sulfur Oxides (lb/unit)</b>	<b>Carbon Monoxide (lb/unit)</b>	<b>Particulate Matter (lb/unit)</b>
Natural Gas (mmscf) / 2 Stroke (Lean-Burn) ICE	122.00	3,233.00	0.60	394.00	39.00
Natural Gas (mmscf) / 4 Stroke (Lean-Burn) ICE*	120.00	4,162.00	0.60	323.00	10.00
Natural Gas (mmscf) / 4 Stroke (Rich-Burn) ICE	30.00	2,254.00	0.60	3,794.00	10.00
Natural Gas (mmscf) / Micro Turbine	77.7	54.4	0.6	466.00	6.73
LPG, Propane, Butane (1000 gal.) / All ICEs & Micro Turbine	83.00	139.00	0.35	129.00	5.00
Diesel/Distillate Oil (1000 gal.) / All ICEs & Micro Turbine	37.5	469.00	0.21	102.00	33.50
Gasoline (1000 gal.) / All ICEs & Micro Turbine	206.00	102.00	5.30	3,940.0	6.50

\* If engine specification is not available, assume 4 Stroke (Lean-Burn) ICE.

**Toxic Air Contaminant (TAC) Emission Factors**

**Natural Gas (lbs/mmscf)**

**External Combustion Equipment, various sizes**

TAC Code	Toxic Air Contaminant	CAS No.	Equipment Rating, MMBTU/HR		
			<10	10 - 100	>100
2	Benzene	71432	0.008	0.0058	0.0017
12	Formaldehyde	50000	0.017	0.0123	0.0036
19	Total PAHs (excluding Naphthalene)*	1151	0.0001	0.0001	0.0001
19	Naphthalene	91203	0.0003	0.0003	0.0003
29	Acetaldehyde	75070	0.0043	0.0031	0.0009
30	Acrolein	107028	0.0027	0.0027	0.0008
32	Ammonia**	7664417	18	18	18
40	Ethyl benzene	100414	0.0095	0.0069	0.002
44	Hexane	110543	0.0063	0.0046	0.0013
239	Propylene	115071	0.731	0.53	0.01553
68	Toluene	108883	0.0366	0.0265	0.0078
70	Xylene	1330207	0.0272	0.0197	0.0058

Source:

\* This value represents a combined default emission factor for toxic compounds within the PAH family. Speciated (by CAS#) PAH are available in the software. Non-AB2588 facilities may use either method to report PAH emission.

\*\* This value corresponds to equipment with Selective Non-catalytic Reduction (SNCR), for equipment with Selective Catalytic Reduction (SCR) substitute listed value by 9.1 lbs/mmscf, and for equipment without SNCR or SCR by 3.2 lbs/mmscf.

**Flare, non-refinery, all sizes**

TAC Code	Toxic Air Contaminant	CAS No.	Factor
2	Benzene	71432	0.159
12	Formaldehyde	50000	1.169
19	Total PAHs (excluding Naphthalene)	1151	0.003
19	Naphthalene	91203	0.011
29	Acetaldehyde	75070	0.043
30	Acrolein	107028	0.01
40	Ethyl benzene	100414	1.444
44	Hexane	110543	0.029
239	Propylene	1150701	2.44
68	Toluene	108883	0.058
70	Xylene	1330207	0.029

**Natural Gas (lbs/mmscf)**

**Turbines and Microturbines, all sizes**

<b>TAC Code</b>	<b>Toxic Air Contaminant</b>	<b>CAS No.</b>	<b>Factor</b>
2	Benzene	71432	0.0122
4	1,3-Butadiene	106990	0.000439
12	Formaldehyde	50000	0.724
19	Naphthalene	91203	0.00133
19	PAHs (excluding Naphthalene) *	1151	0.00224
29	Acetaldehyde	75070	0.0408
30	Acrolein	107028	0.00653
32	Ammonia**	7664417	18
40	Ethylbenzene	100414	0.0326
62	Propylene oxide	75569	0.0296
68	Toluene	108883	0.133
70	Xylene	1330207	0.0653

\* This value represents a combined default emission factor for toxic compounds within the PAH family. Speciated (by CAS#) PAHs are available in the software. Non-AB2588 facilities may use either method to report PAH emission.

\*\* This value corresponds to equipment with Selective Non-catalytic Reduction (SNCR), for equipment with Selective Catalytic Reduction (SCR) substitute listed value by 9.1 lbs/mmscf, and for equipment without SNCR or SCR by 3.2 lbs/mmscf.

**Natural Gas (lbs/mmscf)**

**Stationary and Portable Internal Combustion Engines (ICEs)**

<b>TAC Code</b>	<b>Toxic Air Contaminant</b>	<b>CAS No.</b>	<b>2 Stroke- Lean Burn ICE</b>	<b>4 Stroke- Lean Burn ICE</b>	<b>4 Stroke- Rich Burn ICE</b>
2	Benzene	71432	1.98	0.449	1.61
4	1,3-Butadiene	106990	0.836	0.272	0.676
6	Carbon Tetrachloride	56235	0.0619	0.0374	0.0181
9	Ethylene Dibromide	106934	0.0749	0.0452	0.0217
10	1,2-Dichloroethane	107062	0.043	0.0241	0.0115
12	Formaldehyde	50000	56.3	53.9	20.9
16	Methylene Chloride	75092	0.15	0.0204	0.042
19	PAHs (excl. naphthalene)	1151			0.14382
19	2-Methylnaphthalene	91576	0.0218	0.0339	
19	Acenaphthene	83329	0.00136	0.00128	
19	Acenaphthylene	208968	0.00323	0.00564	
19	Anthracene	120127	0.000732		
19	Benz(a)anthracene	56553	0.000343		
19	Benzo(a)pyrene	50328	0.00000579		
19	Benzo(b)fluoranthene	205992	0.00000868	0.000169	
19	Benzo(e)pyrene	192972	0.0000239	0.000423	
19	Benzo(g,h,i)perylene	191242	0.0000253	0.000422	
19	Benzo(k)fluoranthene	207089	0.00000435	0	
19	Chrysene	218019	0.000685	0.000707	
19	Fluoranthene	206440	0.000368	0.00113	
19	Fluorene	86737	0.00172	0.00578	
19	Indeno(1,2,3-c,d)pyrene	193395	0.0000101		
19	Naphthalene	91203	0.09823	0.0759	0.099
19	Perylene	198550	0.00000507		
19	Phenanthrene	85018	0.0036	0.0106	
19	Pyrene	129000	0.000596	0.00139	
21	Vinyl Chloride	75014	0.0252	0.0152	0.00732
24	1,1,2,2-Tetrachloroethane	79345	0.0676	0.0408	0.0258
25	1,1,2-Trichloroethane	79005	0.0538	0.0324	0.0156
26	1,2,4-Trimethylbenzene	95636	0.113	0.0146	
27	1,2-Dichloropropane	78875	0.0455	0.0274	0.0133
28	1,3-Dichloropropene	542756	0.0447	0.0269	0.013
29	Acetaldehyde	75070	7.92	8.53	2.85
30	Acrolein	107028	7.94	5.24	2.68
32	Ammonia*	7664417	18	18	18

**Stationary and Portable Internal Combustion Engines (ICEs) (Concluded)**

TAC Code	Toxic Air Contaminant	CAS No.	2 Stroke- Lean Burn ICE	4 Stroke- Lean Burn ICE	4 Stroke- Rich Burn ICE
35	Chloroform	67663	0.048	0.0291	0.014
40	Ethylbenzene	100414	0.11	0.0405	0.0253
44	n-Hexane	110543	0.454	1.13	
51	Methanol	67561	2.53	2.55	3.12
57	Chlorobenzene	108907	0.0453	0.031	0.0132
66	Styrene	100425	0.0559	0.0241	0.0121
68	Toluene	108883	0.982	0.416	0.569
70	Xylene	1330207	0.273	0.188	0.199
117	1,2,3-Trimethylbenzene	526738	0.0361	0.0235	0.0115
117	1,3,5-Trimethylbenzene	108678	0.0184	0.0345	
172	Cyclohexane	110827	0.314		
180	1,1-Dichloroethane	75343	0.0399	0.0241	0.0115
230	Phenol	108952	0.0429	0.0245	
296	2,2,4-Trimethylpentane	540841	0.863	0.255	
319	Biphenyl [POM]	92524	0.00401	0.216	

\* Speciated (by CAS#) default emission factors are listed in the software.

\*\* This value corresponds to equipment with Selective Non-catalytic Reduction (SNCR), for equipment with Selective Catalytic Reduction (SCR) substitute listed value by 9.1 lbs/mmscf, and for equipment without SNCR or SCR by 3.2 lbs/mmscf.

**Gasoline (lb/1000 gallons)**

**Stationary and Portable Internal Combustion Engines (ICEs)**

TAC Code	Toxic Air Contaminant	CAS No.	Non-catalyst (Portable and Stationary)	Catalyst, Portable ICE	Catalyst, Stationary ICE
2	Benzene	71432	3.81	1.57	0.156
4	1,3-Butadiene	106990	0.918	0.324	0.0322
12	Formaldehyde	50000	3.45	1.01	0.101
17	Nickel	7440020	0.00325	0.00325	0.00325
19	Naphthalene	91203	0.144	0.0295	0.00293
26	1,2,4-Trimethylbenzene	95636	1.39	0.589	0.0586
29	Acetaldehyde	75070	0.83	0.147	0.0146
30	Acrolein	107028	0.199	0.0825	0.0082
34	Chlorine	7782505	0.455	0.455	0.455
36	Copper	7440508	0.00325	0.00325	0.00325
40	Ethyl benzene	100414	1.66	0.642	0.0638

**Gasoline (lb/1000 gallons)**

**Stationary and Portable Internal Combustion Engines (ICEs) (Concluded)**

<b>TAC Code</b>	<b>Toxic Air Contaminant</b>	<b>CAS No.</b>	<b>Non-catalyst (Portable and Stationary)</b>	<b>Catalyst, Portable ICE</b>	<b>Catalyst, Stationary ICE</b>
44	Hexane	110543	1.45	0.942	0.0937
49	Manganese	7439965	0.00325	0.00325	0.00325
51	Methanol	67561	0.775	0.242	0.024
53	Methyl ethyl ketone - MEK	78933	0.0664	0.0118	0.00117
55	Methyl tert-butyl ether (MTBE)	1634044	2.06	1.15	0.115
66	Styrene	100425	0.144	0.0707	0.00703
68	Toluene	108883	7.51	3.5	0.349
70	m-Xylene	108383	4.92	2.17	0.216
70	o-Xylene	95476	1.71	0.754	0.075
92	Bromine	7726956	0.00325	0.00325	0.00325
94	Chromium	7440473	0.00325	0.00325	0.00325
96	Cobalt	7440484	0.00325	0.00325	0.00325
117	1,3,5-Trimethylbenzene	108678	0.553	0.236	0.0234
117	1,2,3-Trimethylbenzene	526738	0.254	0.106	0.0105
119	Zinc	7440666	0.00325	0.00325	0.00325
168	Crotonaldehyde	4170303	0.144	0.0177	0.00176
169	Cumene	98828	0.0553	0.00589	0.000586
172	Cyclohexane	110827	0.498	0.365	0.0363
211	Isoprene	78795	0.155	0.0825	0.0082
237	Propionaldehyde	123386	0.144	0.0236	0.00234
296	2,2,4-Trimethylpentane	540841	2.2	1.02	0.102

**Jet Fuel (lb/1000 gallons)**

**Turbine**

<b>TAC Code</b>	<b>Toxic Air Contaminant</b>	<b>CAS No.</b>	<b>Factor</b>
2	Benzene	71432	0.938
4	1,3-Butadiene	106990	0.856
5	Cadmium	7440439	0.0168
12	Formaldehyde	50000	7.27
14	Arsenic	7440382	0.178
15	Lead	7439921	0.184
17	Nickel	7440020	0.0168
19	Naphthalene	91203	0.274
29	Acetaldehyde	75070	2.25
30	Acrolein	107028	1.1
40	Ethylene benzene	100414	0.0813
64	Selenium	7782492	0.0168
66	Styrene	100425	0.193
68	Toluene	108883	0.253
70	Xylene	1330207	0.231
94	Total Chromium	7440473	0.182
119	Zinc	7440666	0.184
197	Ethylene	74851	7.32
230	Phenol	108952	0.101
237	Propionaldehyde	123386	0.401

**Diesel / Distillate Oil (lb/1000 gallons)**

**Stationary and Portable Internal Combustion Engines (ICE), all sizes**

TAC Code	Toxic Air Contaminant	CAS No.	Factor
2	Benzene	71432	0.1863
4	1,3-Butadiene	106990	0.2174
5	Cadmium	7440439	0.0015
12	Formaldehyde	50000	1.7261
13	Hexavalent chromium	18540299	0.0001
14	Arsenic	7440382	0.0016
15	Lead	7439921	0.0083
17	Nickel	7440020	0.0039
19	Naphthalene	91203	0.0197
19	PAHs (excluding Naphthalene)*	1151	0.0362
29	Acetaldehyde	75070	0.7833
30	Acrolein	107028	0.0339
32	Ammonia**	7664417	2.9
36	Copper	7440508	0.0041
40	Ethyl Benzene	100414	0.0109
44	Hexane	110543	0.0269
46	Hydrogen Chloride	7647010	0.1863
49	Manganese	7439965	0.0031
50	Mercury	7439976	0.002
57	Chlorobenzene	108907	0.0002
239	Propylene	115071	0.467
64	Selenium	7782492	0.0022
68	Toluene	108883	0.1054
70	Xylenes	1330207	0.0424
72	Diesel exhaust particulates **	9901	33.5
94	Total chromium	7440473	0.0006
119	Zinc	7440666	0.0224

\* This value represents a combined default emission factor for toxic compounds within the PAH family. Speciated (by CAS#) PAHs are listed in the software. Non-AB2588 facilities may use either method to report PAH emission.

\*\* This value corresponds to equipment with Selective Non-catalytic Reduction (SNCR), for equipment with Selective Catalytic Reduction (SCR) substitute listed value by 1.4 lbs/1000 gallons, and for equipment without SNCR or SCR by 0.8 lbs/1000 gallons.

\*\*\* Diesel exhaust particulate emissions are emitted from ICE only, do not use for turbines and micro-turbines.

**Diesel / Distillate Oil (lb/1000 gallons)**

**External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)  
Turbines and Microturbines, all sizes**

<b>TAC Code</b>	<b>Toxic Air Contaminant</b>	<b>CAS No.</b>	<b>Factor</b>
2	Benzene	71432	0.0044
4	1,3-Butadiene	106990	0.0148
5	Cadmium	7440439	0.0015
12	Formaldehyde	50000	0.3506
13	Hexavalent chromium	18540299	0.0001
14	Arsenic	7440382	0.0016
15	Lead	7439921	0.0083
17	Nickel	7440020	0.0039
19	Total PAHs (excluding Naphthalene)	1151	0.0445
19	Naphthalene	91203	0.0053
29	Acetaldehyde	75070	0.3506
30	Acrolein	107028	0.3506
32	Ammonia*	7664417	2.9
36	Copper	7440508	0.0041
40	Ethyl Benzene	100414	0.0002
44	Hexane	110543	0.0035
46	Hydrogen chloride	7647010	0.1863
49	Manganese	7439965	0.0031
50	Mercury	7439976	0.002
57	Chlorobenzene	108907	0.0002
239	Propylene	115071	0.01
64	Selenium	7782492	0.0022
68	Toluene	108883	0.0044
70	Xylenes	1330207	0.0016
94	Total Chromium	7440473	0.0006
119	Zinc	7440666	0.0224

**LPG/Butane/Propane (lb/1000 gallons)****External Combustion Equipment (Boiler, Oven, Dryer, Furnace, Heater, Afterburner)**

TAC Code	Toxic Air Contaminant	CAS No.	Equipment Rating, MMBTU/HR		
			<10	10 - 100	>100
2	Benzene	71432	0.000709	0.000515	0.000151
12	Formaldehyde	50000	0.00151	0.00109	0.000319
19	PAHs (excluding Naphthalene)*	1151	8.87E-06	8.87E-06	8.87E-06
19	Naphthalene	91203	2.66E-05	2.66E-05	2.66E-05
29	Acetaldehyde	75070	0.000382	0.000275	0.0000799
30	Acrolein	107028	0.00024	0.00024	0.000071
32	Ammonia	7664417	0.3	0.3	0.3
40	Ethyl benzene	100414	0.000843	0.000612	0.000177
44	Hexane	110543	0.000559	0.000408	0.000115
239	Propylene	115071	0.065575	0.047544	0.001393
68	Toluene	108883	0.00325	0.00235	0.000692
70	Xylene	1330207	0.00241	0.00175	0.000515

\* This value represents a combined default emission factor for toxic compounds within the PAH family. Speciated (by CAS#) PAHs are available in the software. Non-AB2588 facilities may use either method to report PAH emission.

**Turbines and Microturbines, all sizes**

TAC Code	Toxic Air Contaminant	CAS No.	Factor
2	Benzene	71432	0.00109
4	1,3-Butadiene	106990	3.89E-05
12	Formaldehyde	50000	0.0643
19	Naphthalene	91203	0.000118
19	PAHs (excluding Naphthalene)*	1151	8.15E-05
29	Acetaldehyde	75070	0.00362
30	Acrolein	107028	0.00058
32	Ammonia	7664417	0.3
40	Ethylbenzene	100414	0.0029
62	Propylene oxide	75569	0.00262
68	Toluene	108883	0.0118
70	Xylene	1330207	0.00579

**LPG/Butane/Propane (lb/1000 gallons)**

**Stationary and Portable Internal Combustion Engines (ICEs)**

TAC Code	Toxic Air Contaminant	CAS No.	2 Stroke- Lean Burn ICE	4 Stroke- Lean Burn ICE	4 Stroke- Rich Burn ICE
2	Benzene	71432	0.178	0.0398	0.143
4	1,3-Butadiene	106990	0.0742	0.0242	0.06
6	Carbon Tetrachloride	56235	0.00549	0.00332	0.0016
9	Ethylene Dibromide	106934	0.00664	0.00401	0.00193
10	1,2-Dichloroethane	107062	0.00382	0.00214	0.00102
12	Formaldehyde	50000	5	4.78	1.86
16	Methylene Chloride	75092	0.0133	0.00181	0.00373
19	PAHs (excl. naphthalene)	1151	--	--	0.0129015
19	2-Methylnaphthalene	91576	0.00194	0.003	0
19	Acenaphthene	83329	0.000121	0.000113	0
19	Acenaphthylene	208968	0.000287	0.0005	0
19	Anthracene	120127	0.000065	0	0
19	Benz(a)anthracene	56553	3.04E-05	0	0
19	Benzo(a)pyrene	50328	5.14E-07	0	0
19	Benzo(b)fluoranthene	205992	7.71E-07	0.000015	0
19	Benzo(e)pyrene	192972	2.12E-06	3.76E-05	0
19	Benzo(g,h,i)perylene	191242	2.24E-06	3.75E-05	0
19	Benzo(k)fluoranthene	207089	3.86E-07	0	0
19	Chrysene	218019	6.08E-05	6.27E-05	0
19	Fluoranthene	206440	3.27E-05	0.0001	0
19	Fluorene	86737	0.000153	0.000513	0
19	Indeno(1,2,3-c,d)pyrene	193395	8.99E-07	0	0
19	Naphthalene	91203	0.00872	0.00673	0.00879
19	Perylene	198550	4.50E-07	0	0
19	Phenanthrene	85018	0.000319	0.000941	0
19	Pyrene	129000	5.29E-05	0.000123	0
21	Vinyl Chloride	75014	0.00224	0.00135	0.00065
24	1,1,2,2-Tetrachloroethane	79345	0.006	0.00362	0.00229
25	1,1,2-Trichloroethane	79005	0.00477	0.00288	0.00138
26	1,2,4-Trimethylbenzene	95636	0.01	0.00129	0
27	1,2-Dichloropropane	78875	0.00404	0.00243	0.00118
28	1,3-Dichloropropene	542756	0.00396	0.00239	0.00115
29	Acetaldehyde	75070	0.702	0.757	0.252
30	Acrolein	107028	0.704	0.465	0.238
32	Ammonia	7664417	0.3	0.3	0.3
35	Chloroform	67663	0.00426	0.00258	0.00124

**LPG/Butane/Propane (lb/1000 gallons)**

**Stationary and Portable Internal Combustion Engines (ICEs) (Concluded)**

TAC Code	Toxic Air Contaminant	CAS No.	2 Stroke- Lean Burn ICE	4 Stroke- Lean Burn ICE	4 Stroke-Rich Burn ICE
40	Ethylbenzene	100414	0.00977	0.00359	0.00224
44	n-Hexane	110543	0.0403	0.1	0
51	Methanol	67561	0.224	0.226	0.277
57	Chlorobenzene	108907	0.00385	0.002637	0.00112
66	Styrene	100425	0.00496	0.00214	0.00108
68	Toluene	108883	0.0872	0.0369	0.0505
70	Xylene	1330207	0.0243	0.0167	0.0176
117	1,2,3-Trimethylbenzene	526738	0.00307	0.00199	0.000979
117	1,3,5-Trimethylbenzene	108678	0.00156	0.00293	0.242
172	Cyclohexane	110827	0.0267		
180	1,1-Dichloroethane	75343	0.00339	0.00205	0.000979
230	Phenol	108952	0.00365	0.00208	
296	2,2,4-Trimethylpentane	540841	0.0733	0.0217	
319	Biphenyl [POM]	92524	0.000342	0.0184	

**Landfill Gas (lb/mmscf)**

**External Combustion Equipment, all sizes**

TAC Code	Toxic Air Contaminant	CAS No.	Factor
3	Beryllium	7440417	0.0011
5	Cadmium	7440439	0.0067
7	1,2,3,4,5,6,7,8-Octachlorodibenzofuran	39001020	1.45E-06
7	1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879	1.45E-06
7	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562394	1.45E-06
7	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469	1.45E-06
7	1,2,3,6,7,8-Hexachlorodibenzofuran	57117449	7.27E-07
7	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653857	7.27E-07
7	1,2,3,7,8-Pentachlorodibenzofuran	57117416	7.27E-07
7	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321764	7.27E-07
7	2,3,7,8-Tetrachlorodibenzofuran	51207319	7.27E-07
7	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	7.27E-07
12	Formaldehyde	50000	0.134
13	Hexavalent chromium	18540299	0.000714
14	Arsenic	7440382	0.00394
15	Lead	7439921	0.00685

**Landfill Gas (lb/mmscf)****External Combustion Equipment, all sizes (Concluded)**

<b>TAC Code</b>	<b>Toxic Air Contaminant</b>	<b>CAS No.</b>	<b>Factor</b>
17	Nickel	7440020	0.115
19	Acenaphthene	83329	0.000419
19	Acenaphthylene	208968	0.000419
19	Anthracene	120127	0.000419
19	Benzo(a)anthracene	56553	0.000419
19	Benzo(a)pyrene	50328	0.000419
19	Benzo(b)fluoranthene	205992	0.000419
19	Benzo(g,h,l)perylene	191242	0.000419
19	Benzo(k)fluoranthene	207089	0.000419
19	Chrysene	218019	0.000419
19	Dibenz(a,h)anthracene	53703	0.000419
19	Fluoranthene	206440	0.000419
19	Fluorene	86737	0.000419
19	Indeno(1,2,3-cd)pyrene	193395	0.000419
19	Naphthalene	91203	0.259
19	Phenanthrene	85018	0.000419
19	Pyrene	129000	0.000419
32	Ammonia	7664417	2.35
36	Copper	7440508	0.0111
49	Manganese	7439965	0.379
50	Mercury	7439976	7.86E-05
64	Selenium	7782492	0.000508
94	Total Chromium	7440473	0.057621
119	Zinc	7440666	0.088442

**Landfill Gas (lb/mmscf)**

**Stationary and Portable Internal Combustion Engines (ICE), Turbines, and Micro Turbines**

TAC Code	Toxic Air Contaminant	CAS No.	Factor
2	Benzene	71432	0.0084
6	Carbon tetrachloride	56235	0.00072
16	Methylene chloride	75092	0.00092
18	Perchloroethylene	127184	0.001
20	Trichloroethylene	79016	0.00076
21	Vinyl chloride	75014	0.00064
35	Chloroform	67663	0.00056
57	Chlorobenzene	108907	0.00116
68	Toluene	108883	0.044
70	Xylenes	1330207	0.0124
121	Acetonitrile	75058	0.0048
297	Benzyl chloride	100447	0.0048

**Digester Gas (lb/mmscf)**

**External Combustion Equipment**

TAC Code	Toxic Air Contaminant	CAS No.	Equipment Rating, MMBTU/HR		
			<10	10 - 100	>100
2	Benzene	71432	0.008	0.0058	0.0017
12	Formaldehyde	50000	0.017	0.0123	0.0036
19	Total PAHs (excluding Naphthalene)*	1151	0.0001	0.0001	0.0001
19	Naphthalene	91203	0.0003	0.0003	0.0003
29	Acetaldehyde	75070	0.0043	0.0031	0.0009
30	Acrolein	107028	0.0027	0.0027	0.0008
32	Ammonia	7664417	3.2	3.2	3.2
40	Ethyl benzene	100414	0.0095	0.0069	0.002
44	Hexane	110543	0.0063	0.0046	0.0013
68	Toluene	108883	0.0366	0.0265	0.0078
70	Xylene	1330207	0.0272	0.0197	0.0058
239	Propylene	115071	0.731	0.53	0.01553

PAH family. Speciated (by CAS#) PAHs are available in the software. Non-AB2588 facilities may use either method to report PAH emission.

## Digester Gas (lb/mmscf)

### **Stationary and Portable Internal Combustion Engines (ICE), Turbines, and Micro Turbines**

<b>TAC Code</b>	<b>Toxic Air Contaminant</b>	<b>CAS No.</b>	<b>Factor</b>
4	1,3 Butadiene	106990	0.00588
5	Cadmium	7440439	0.000348
6	Carbon tetrachloride	56235	0.012
10	Ethylene dichloride	107062	0.009
12	Formaldehyde	50000	0.114
14	Arsenic	7440382	0.00138
15	Lead	7439921	0.00204
16	Methylene chloride	75092	0.0078
17	Nickel	7440020	0.0012
18	Perchloroethylene	127184	0.0126
20	Trichloroethylene	79016	0.0108
21	Vinyl chloride	75014	0.0216
29	Acetaldehyde	75070	0.0318
35	Chloroform	67663	0.0102
32	Ammonia	7664417	3.2
57	1,4 Dichlorobenzene	106467	0.012
57	Chlorobenzene	108907	0.0096
64	Selenium	7782492	0.0066
94	Total Chromium	7440473	0.00072
259	Vinylidene Chloride	75354	0.009

## Process Gas

### Associated Process Gas (lbs/mmscf) (all equipment)

<b>TAC Code</b>	<b>Toxic Air Contaminant</b>	<b>CAS No.</b>	<b>Factor</b>
2	Benzene	71432	0.159
12	Formaldehyde	50000	1.169
19	Total PAHs (excluding Naphthalene)*	1151	0.014

\* This value represents a combined default emission factor for toxic compounds within the PAH and Chlorinated dioxins and dibenzofurans family. Speciated (by CAS#) default emission factors are listed in the software. Non-AB2588 facilities may use either method to report PAH and Chlorinated dioxins and dibenzofurans emission.