

TABLE ONE

**AP-42 5th ED Uncontrolled Emission Factors
(includes changes found in Supplements A through G)**

<u>SCC Code</u>	<u>Fuel</u>	<u>PT</u>	<u>SO₂</u>	<u>NO_x</u>	<u>CO</u>	<u>NON METHANE VOCs</u>
BOILERS						
External Combustion Boilers >100 MMBTU/hr - Utility						
<u>Residual oil</u>			<u>(lb/1000 gallons)</u>			
1-01-004-01	#6 oil normal fire	9.19(S)+3.22	157(S)	47.0	5.0	0.76
1-01-004-04	#6 oil tangential fire	9.19(S)+3.22	157(S)	32.0	5.0	0.76
1-01-004-05	#5 oil normal fire	10.0	157(S)	47.0	5.0	0.76
1-01-004-06	#5 oil tangential fire	10.0	157(S)	32.0	5.0	0.76
<u>Distillate oil</u>			<u>(lb/1000 gallons)</u>			
1-01-005-01	#1 and #2 oil	2.0	142(S)	24.0	5.0	0.20
1-01-005-04	#4 oil normal fire	7.0	150(S)	47.0	5.0	0.76
1-01-005-05	#4 oil tangential fire	7.0	150(S)	32.0	5.0	0.76
<u>Natural Gas</u>			<u>(lb/MMCF)</u>			
1-01-006-01	NG	1.9	0.6	190.0	84.0	5.5
1-01-006-04	NG - tangential fire	1.9	0.6	170.0	24.0	5.5
<u>Wood/Bark waste >50,000 LB Steam (assumes >20% moisture in fuel)</u>			<u>(lb/mmbtu)</u>			
1-01-009-01	Bark-fired boiler	0.30#	0.025	0.22	0.60	0.017
1-01-009-02	Wood/bark fired boiler	0.30#	0.025	0.22	0.60	0.017
1-01-009-03	Wood fired boiler	0.30#	0.025	0.22	0.60	0.017
External combustion Boilers 10 to 100 MMBTU/hr - INDUSTRIAL						
<u>Residual oil</u>			<u>(lb/1000 gallons)</u>			
1-02-004-01	#6 oil	9.19(S)+3.22	157(S)	55.0	5.0	0.28
1-02-004-04	#5 oil	10.0	157(S)	55.0	5.0	0.28
<u>Distillate oil</u>			<u>(lb/1000 gallons)</u>			
1-02-005-01	#1 and #2 oil	2.0	142(S)	20.0	5.0	0.2
1-02-005-04	#4 oil	7.0	150(S)	20.0	5.0	0.2

Red indicates changes since last revision

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<u>Natural gas</u>			(lb/MMCF)			
1-02-006-02	NG	1.9	0.6	100.0	84.0	5.5
<u>Wood/Bark waste <50,000 LBS STEAM (>20% moisture in fuel)</u>			(lb/mmbtu)			
1-02-009-05	Wood/bark fired boiler	0.30#	0.025	0.22	0.60	0.017
1-02-009-06	Wood fired boiler	0.30#	0.025	0.22	0.60	0.017
<u>(<20% moisture in fuel)</u>						
1-02-009-06	Wood fired boiler	0.30#	0.025	0.49	0.60	0.017
<u>Liquified Petroleum Gas</u>			(lb/1000 gallons)			
1-02-010-02	Propane	0.2	0.1(\$)	13.0	7.5	0.8
<u>Liquid Waste</u>			(lb/1000 gallons)			
1-02-013-02	Waste Oil	64(A)	147(S)	19.0	5.0	---
External combustion Boilers 0.5 to 10 MMBTU/hr -COMMERCIAL/INSTITUTIONAL						
<u>Residual oil</u>			(lb/1000 gallons)			
1-03-004-01	#6 oil	9.19(S)+3.22	157(S)	55.0	5.0	1.13
1-03-004-04	#5 oil	10.0	157(S)	55.0	5.0	1.13
<u>Distillate oil</u>			(lb/1000 gallons)			
1-03-005-01	#1 and #2 oil	2.0	142(S)	20.0	5.0	0.34
1-03-005-04	#4 oil	7.0	150(S)	20.0	5.0	0.34
<u>Natural gas</u>			(lb/MMCF)			
1-03-006-03	NG	1.9	0.6	100.0	84.0	5.5
<u>Wood/Bark waste (<20% moisture in fuel)</u>			(lb/mmbtu)			
1-03-009-03	Wood fired boiler	0.30#	0.025	0.49	0.60	0.017
<u>Liquified Petroleum Gas</u>			(lb/1000 gallons)			
1-03-010-02	Propane	0.2	0.1(\$)	13.0	7.5	0.8
<u>Liquid Waste</u>			(lb/1000 gallons)			
1-03-013-02	Waste oil	64(A)	147(S)	19.0	5.0	---

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External Combustion Boilers-Space Heaters						
<u>Industrial</u> (lb/1000 gallons)						
1-05-001-05	Distillate oil	0.4	142(S)	18.0	5.0	0.7
1-05-001-06	Natural Gas (lb/mmcf)	1.9	0.6	94.0	40.0	5.5
1-05-001-10	LPG	0.2	0.1(\$)	13.0	7.5	0.8
1-05-001-13	Waste oil- air atomized	66(A)	107(S)	16.0	2.1	---
1-05-001-14	Waste oil- vaporizing	2.8(A)	100(S)	11.0	1.7	---
<u>Commercial-Institutional</u> (lb/1000 gallons)						
1-05-002-05	Distillate oil	0.4	142(S)	18.0	5.0	0.7
1-05-002-06	Natural Gas (lb/mmcf)	1.9	0.6	94.0	40.0	5.5
1-05-002-10	LPG	0.2	0.1(\$)	13.0	7.5	0.8
1-05-002-13	Waste oil- air atomized	66(A)	107(S)	16.0	2.1	---
1-05-002-14	Waste oil- vaporizing	2.8(A)	100(S)	11.0	1.7	---
ENGINES						
Internal Combustion Engines - Large Stationary						
<u>Distillate</u> (lb/mmbtus)						
2-01-001-01	Turbine	0.0043	1.01(S)	0.88	0.0033	0.00041
2-02-004-01	Reciprocating>600HP	0.062	1.01(S)	3.20	0.85	0.082
<u>Natural gas</u> (lb/mmbtus)						
2-01-002-01	Turbine	0.0019	0.94S	0.32	0.082	0.0021
2-01-004-02	Reciprocating (assumes 4-stroke lean burn)	0.0000771	0.000588	0.847	0.557	0.118
Internal Combustion Engines - Small Stationary						
<u>Distillate</u> (lb/mmbtus)						
2-02-001-01	Turbine	0.0043	1.01(S)	0.88	0.0033	0.00041
2-02-001-02	Reciprocating <600HP	0.30#	0.29	3.56**	0.95	0.32**
<u>Natural gas</u> (lb/mmbtus)						
2-02-002-01	Turbine	0.0019	0.94S	0.32	0.082	0.0021
2-02-002-02	Reciprocating (assumes 4-stroke lean burn)	0.0000771	0.000588	0.847	0.557	0.118
<u>Gasoline</u> (lb/mmbtus)						
2-03-003-01	Reciprocating	0.1	0.084	1.63	0.99	---

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REFUSE COMBUSTION						
<u>Incineration</u> (assumes modular starved air)			(lb/ton)			
5-01-001-01	Municipal Waste	3.43	3.23	3.16	0.299	1.50
<u>Other incineration</u>			(lb/ton)			
5-01-005-15	Sewage Sludge	100.0	20.0	5.0	31.0	1.7
5-02-005-01	Medical Waste	4.67	2.17	3.56	2.95	1.0

AP-42 Default Values

	<u>FUEL</u>	<u>BTU</u>	<u>SULFUR</u>	<u>ASH</u>
A: Weight percent of ash in fuel	RESIDUAL OIL	150,000/gal	0.5-4.0	0.05-.1
S: Weight percent of sulfur in fuel	WASTE OIL	145,000/gal	<1.0	<1.0
\$: Sulfur in gr/100CF of gas vapor	DISTILATE OIL	140,000/gal	0.2-1.0	---
---: No current AP-42 Emission Factor	DIESEL	137,000/gal	0.4	---
Dual fuel: 95% natural gas and 5% diesel	KEROSENE	135,000/gal	0.02-0.05	---
	GASOLINE	130,000/gal	0.03-0.04	---
	PROPANE (LPG)	94,000/gal	<15gr/100cf	
	NATURAL GAS	1,020/cf	---	
	BITUMINOUS COAL	13,000/lb	0.6-5.4	4.0-20.0
	ANTHRACITE COAL	12,300/lb	0.5-1.0	7.0-16.0
* From Marks' Handbook of Mechanical Engineering	BARK (50% MOIST)	4,500/lb	---	1.0-3.0
** DES Emission Factors	WOOD (80% MOIST)*	1,750/lb	---	1.0-3.0
#From Env-A 2003.03 which states	WOOD (50% MOIST)*	4,375/lb	---	1.0-3.0
No owner or operator shall cause or allow emissions of particulate matter	WOOD (20% MOIST)*	7,000/lb	---	1.0-3.0
from fuel burning devices installed on or after January 1, 1985, to exceed the specified value of E, where:	WOOD (0% MOIST)*	8,750/lb	---	1.0-3.0

(1) For devices for which I is less than 100, E shall be 0.30;

(2) For devices for which I is equal to or greater than 100 but less than 250, E shall be 0.15; and

(3) For devices for which I is equal to or greater than 250, E shall be 0.10.

(E = particulate emission rate (lbmmbtu), I = heat input (mmbtu/hr))

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