

# Emissions for Coal-Fired Power Plants

## Emission Factor Conversions <sup>(1)</sup>

Because there are so many methods to burn coal, the 'worst-case' emission factor was chosen from AP-42<sup>(2)</sup>. Those emission factors are given in lb/ton. To convert to weight/energy, the emission factors were divided by 26 lb/MMBTU as directed by AP42. The factors in lb/MMBTU were converted to lb/kWh by dividing by 293.07 kWh per MMBTU (1 btu = 0.000293071 kWh).



### SULFUR OXIDES (SO<sub>x</sub>)

Given emission factor = 38S  
(where S is % sulfur in coal, assumed to be 1.2%)

$$38 \times 1.2 = 45.6$$

$$45.6 \text{ lb/ton} \times \text{ton} / 26 \text{ MMBtu} = 1.75 \text{ lb/MMBtu}$$

$$1.75 \text{ lb/MMBtu} \times \text{MMBtu}/293.07 \text{ kWh} = 0.006 \text{ lb SO}_x/\text{kWh}$$

### NITROGEN OXIDES (NO<sub>x</sub>)

Given emission factor = 31 lb/ton

$$31 \text{ lb/ton} \times \text{ton} / 26 \text{ MMBtu} = 1.19 \text{ lb/MMBtu}$$

$$1.19 \text{ lb/MMBtu} \times \text{MMBtu}/293.07 \text{ kWh} = 0.004 \text{ lb NO}_x/\text{kWh}$$

### CARBON DIOXIDE (CO<sub>2</sub>)

Given emission factor = 6,250 lb/ton

$$6250 \text{ lb/ton} \times \text{ton} / 26 \text{ MMBtu} = 240 \text{ lb/MMBtu}$$

$$240 \text{ lb/MMBtu} \times \text{MMBtu}/293.07 \text{ kWh} = 0.82 \text{ lb CO}_2/\text{kWh}$$

### METHANE (CH<sub>4</sub>)

Given emission factor = 0.8 lb/ton

$$0.8 \text{ lb/ton} \times \text{ton} / 26 \text{ MMBtu} = 0.03 \text{ lb/MMBtu}$$

$$0.03 \text{ lb/MMBtu} \times \text{MMBtu}/293.07 \text{ kWh} = 1.05 \text{ lb CH}_4/\text{kWh}$$

### MERCURY (Hg)

Given emission factor =  $8.3 \times 10^{-5}$  lb/ton

$$8.3 \times 10^{-5} \text{ lb/ton} \times \text{ton} / 26 \text{ MMBtu} = 3.2 \times 10^{-6} \text{ lb/MMBtu}$$

$$3.2 \times 10^{-6} \text{ lb/MMBtu} \times \text{MMBtu}/293.07 \text{ kWh} = 1.09 \times 10^{-8} \text{ lb/kWh}$$

## References

- (1) Silverspot Consulting, [silverspot@optonline.net](mailto:silverspot@optonline.net)
- (2) United States Environmental Protection Agency  
Compilation of Emission Factors  
AP-42, Volume 1, Fifth edition, 1995  
<http://www.epa.gov/ttn/chief/ap42/index.html>