

**D04 - WET DRILLING & BLASTING OPERATIONS, AMMONIUM NITRATE WITH FUEL OIL, BUMPING, SECTIONS 11.9, 11.19, & 13.3 OF AP42 (1/95)**

**CALCULATION METHODS**

(Fugitive Releases - Particulates)

$$Ea = [(Ua \times EF) + (N \times 0.000014 \times A^{1.5})] \times Ci$$

Wet Drilling EF (lbs/ton quarried) = 0.000154 for TSP and 0.00008 for PM10

$$Eh = [(Ua \times EF / H) + (0.000014 \times A^{1.5})] \times Ci$$

(Fugitive Releases - NOx, CO, SOx)

$$Ea = (\text{Blasts/yr}) \times (\text{ave charges/blast}) \times (\text{ave lbs/charge}) \times (1/2000) \times EF$$

Blasting EF (lbs/ton explosives detonated) = 67 for CO, 17 for NOx, and 2 for SOx.

$$Eh = (\text{Max charges/blast}) \times (\text{ave lbs/charge}) \times (1/2000) \times EF$$

(Ducted Releases)

$$Ea = 0$$

$$Eh = 0$$

**Notes:**

- The AWR / MPI / District meetings in 1995 and 1996 did not produce a consensus approach toward estimating emissions from drilling and blasting at mineral industry sites.
- The District procedure for blasting is based on the particulate emission estimation method for coal or overburden in Section 11.9, Table 11.9-2 of AP-42 (1/95).
- The District procedure for wet drilling is the  $8.0 \times 10^{-5}$  factor published in Table 11.19.2-2 of AP-42 (1/95). A TSP factor of  $1.54 \times 10^{-4}$  was back calculated assuming a PM10 content of 52%.
- The District procedure for estimating NOx, CO, and SOx for the explosives detonation is based on the emission factors published in Table 13.3-1 of AP-42 (1/95).
- All emissions for this calculation procedure are assumed to be fugitive. No additional capture or control efficiencies should be applied.
- Trace metal concentrations for particulate emissions are based on the analysis for crushed fines from drill & shoot operations (Profile 2) submitted to the District by AWR in July 1996.
- The AWR - MPI Industry group requested four amendments to the EPA blasting procedure in a document received by the District on 3/18/96. To date, these amendments have NOT been incorporated;
- Silt Content Adjustment Factor - The Industry group requested a modification of the EPA blasting procedure to account for material silt content (siltcontent before or after the blast?). No supporting information has been provided.
- Land Use Condition Reduction Factor - The Industry group proposed a 25% emission reduction blast sites possessing LAND-USE conditions requiring unspecified surface preparations. No details have been provided.
- Bumping Reduction Factor - The Industry group proposed a 75% emission reduction for "bumping". The existing AP-42 already appears to represent this type of blasting.
- Health Evaluation Exemption - The Industry group opposes considering blasting emissions in evaluating health effects from short term exposure scenarios. No justification for omitting these emissions has been provided.

POLLUTANT	DISTRICT EMISSION FACTORS (ppmw)	REFERENCE DOCUMENT	ARB	(UNITS)	COMMENTS
NOX	17 lbs/ton explosive		17.00	lbs/ton explosive	Emissions based on amount of explosives used.
CO	67 lbs/ton explosive	AP-42, Section 13.3, Table 13.3-1	67.00	lbs/ton explosive	Emissions based on amount of explosives used.
SOX	2 lbs/ton explosive		2.00	lbs/ton explosive	Emissions based on amount of explosives used.

POLLUTANT	DISTRICT EMISSION FACTORS (ppmw)	REFERENCE DOCUMENT	ARB	(UNITS)	COMMENTS
TOG					
ROG					
TSP	1,000,000.00				
PM10	1,000,000.00				
ALUMINUM	21,000.00				Based on local test results.
ARSENIC	15.00				Based on local test results.
BARIUM	120.00				Based on local test results.
BERYLLIUM	1.00				Based on local test results.
CADMIUM	1.00				Based on local test results.
CHROMIUM HEXAVALENT	-				
CHROMIUM NONHEXA VALENT	46.00				Based on local test results.
COBALT	18.00				Based on local test results.
COPPER	94.00				Based on local test results.
LEAD	30.00				Based on local test results.
MANGANESE	565.00				Based on local test results.
MERCURY	-				
NICKEL	30.00				Based on local test results.
SELENIUM	1.00				Based on local test results.
SILICA, CRYSTALLINE	100,000.00				Based on local test results.
RESPIRABLE SILICA, CRYSTALLINE CRISTOBALITE QUARTZ	7,950.00				PM4 fraction of PM10 silica, assumed to be 7.95%
ZINC	100.00				Based on local test results.