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Development of Emission Factors for Quantification of Blasting Dust at Surface

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ABSTRACT

Environmental impact assessment (EIA) and environmental management plan (EMP) is a statutory requirement for execution of new mining projects or for expansion of the operating projects. For this purpose, quantification of blasting dust emission is required. This can be done by developing emission factors for blasting. The concept is similar to that of specific charge in blasting. For mining operations other than blasting, quantification of dust can be done using emission factors. Emission estimation techniques are very limited for blasting. In this study, the emission factors were developed by carrying out a detailed field study at one of the largest opencast coal mines of India in all four seasons. Data on atmospheric and meteorological conditions were generated by installing sodar and automatic weather station at the mine site. Respirable dust samplers were installed for monitoring of the dust emitted during coal or overburden bench blasting. Emission factors for dust concentrations were developed in gram per cubic meter of rock excavated. The developed emission factors were used to estimate dust emissions for adjacent mines due to similarity in mining and meteorological conditions. Seasonal variations in moisture contents in benches, where dust was monitored, indicated the lowest emission factors in monsoon due to high moisture in the bench materials. Similar field studies were also conducted at another coalfield of India for two seasons. It was found that the emission factors are site-specific.

KEYWORDS

Emission Factor, Blasting Dust, Particulate Matter, Surface Coal Mines

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