

MODELAMIENTO DE MATERIAL PARTICULADO DE PM10 EN OPERACIONES MINERAS

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Abstract

Current regulations on air quality in areas with population representativeness (EMRP), considers two critical thresholds: The first is not to exceed $150 \mu\text{g}/\text{m}^3$ per day and, the second is regarding an average of three consecutive calendar years, be under the value of $50 \mu\text{g}/\text{m}^3$ (DTO59 and DTO61).

For mining operations with nearby communities, the proper management of dust emissions becomes a critical control to avoid the stoppage of activities due to over-saturation of dust.

To achieve a correct management of dust emissions in order to minimize the environmental impact on air quality and without put production plans at risk, a PM10 predictive model has been developed for mining company Spence and the Sierra Gorda community to be incorporated into the short and medium term production plans.

The phenomenon of PM10 is dependent on multiple factors, both natural and anthropic. Of the most relevant for the modeling, the local meteorology and the activity level of the operation appear. The development of this model includes data from dust and meteorology measurement stations owned by Spence, located in the town of Sierra Gorda as well as in different points of the mining operation. The prediction has been separated into two stages, the first consisting of local scale weather modeling (Spence). The second one consists in the modeling of PM10 from the mining activity and the weather forecast, giving a vision of the dust behavior for the next 10 days in the future. In addition, this development allows inferring which are the main drivers of the phenomenon, which can have a pro-activity in dust management issues.

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