



## **institute of makers of explosives**

### **Fumes from Blasting**

**Issue:** Should the Department of Interior’s Office of Surface Mining Reclamation and Enforcement (OSMRE) promulgate a standard prohibiting visible emissions from blasting operations?

**Background:** In April 2014, WildEarth Guardians (WEG) petitioned OSMRE to consider a rule to prohibit the production of visible nitrogen oxide (NO<sub>2</sub>) during blasting operations for coal mining activities. IME believes that such a standard would be unattainable on a reliable and consistent basis.

**Discussion:** The detonation of explosives involves a chemical reaction that unavoidably results in the production of certain gases. While steps can be taken to help reduce the production of gases, they cannot be eliminated altogether. During blasting operations, ideal conditions are rarely, if ever, encountered. The contamination of the explosives products with ground or surface water and drill cuttings, reactivity of the explosives with the rock or other materials being blasted, instability within boreholes, and subsurface geological formations will impact emissions. All of these frequently encountered and largely uncontrollable elements affect the explosive quality and chemical kinetics of the product.

While attempts can be made to minimize emissions, the environmental variables discussed above cannot be eliminated or influenced in a manner that would allow the categorical “prevention” of visible emissions in all cases. There is no way to prospectively determine, from a technical or scientific perspective, whether all conditions affecting blasting will be optimum from shot to shot.

In addition, we do not agree that varying opacity of visible emissions generated by blasting can be equated to the concentration of NO<sub>2</sub> in the “cloud.” Because of the inherent difficulties involved in obtaining direct measurements of particular gases in post-blast emission clouds, opacity monitoring has been used as a fall back measure to alert workers and the public of the presence of some amount of NO<sub>2</sub>. Opacity is not, however, an accurate means of determining actual concentrations of the chemical. Color perception is highly subjective and is influenced by numerous other factors including the intensity of the sunlight, the perspective/location from which a visible emission is viewed, the presence of other particulates in the ambient air, and the background against which an emission is viewed. It cannot be used as a measure of regulatory compliance.

Existing regulations administered by OSMRE, EPA, and MSHA also safeguard mine employees and surrounding communities. These regulations, in tandem with the voluntary efforts of mine operators in implementing extensive administrative controls operate in unison to successfully ensure the safety of workers and the public.

**Recommendations:** IME recommends that mine operators continue to work with blasters within the confines of current regulations, augmented by administrative controls, to minimize emissions. No additional regulatory action is necessary at this time.