

ENVIRONMENTAL EFFECTS OF BLASTING AND THEIR CONTROL

David E. Siskind
Mark S. Stagg

DESA, D. E. Siskind and Associates, LLC.

ABSTRACT

Five major environmental effects of rock blasting are ground vibrations, airblast, flyrock, dust and fumes. What makes them "environmental" as opposed to occupational health and safety issues is that their impacts are felt off the mine, quarry or construction site. For some impacts, safe zones are defined through experience, flyrock being a good example. Flyrock at a mine can be 1) rock thrown beyond the blast area or expected hazard zone, 2) rock thrown beyond the permit area, or 3) rock thrown more than 1/2 the distance to the nearest non-mine structure (OSM rule for surface coal mines). Rock throw of less than the "flyrock" range is then a safety issue.

Recognizing an environmental problem is straight forward in some cases. Impacting flyrock and orange fumes are immediate and visible manifestations of blasting. Vibrations and airblast are subject to interpretation. If sufficiently strong, they can produce responses and cracks in homes which are similar in degree and nature to those caused by a variety of cultural and natural forces. Only after a great amount of research done worldwide has it been possible to accurately address damage risks from blasting and establish definitive safe levels for both vibrations and airblast. Dust is another impact with multiple causes. At most sites, vehicles on haul roads, crushing machinery and other noise sources are typically more impacting than the relatively infrequent blasts.

Flyrock and fumes are definite blasting problems needing immediate attention. Other issues such as vibrations and airblast require comparisons with some "norms." The blaster has to know if the impacts are typical or whether site-specific or practice-specific problems exist and that measures are needed to address them. In all this are practical issues of being a good neighbor, reducing the threat of lawsuits, meeting regulatory levels, and the costs of operation.