



CITIZEN'S GUIDE TO EXPLOSIVES REGULATIONS IN PENNSYLVANIA

INTRODUCTION:

If you live near a mine, quarry or construction site, you may feel the effects of blasting. These operations conduct blasting to help extract minerals from the ground or to excavate road cuts, utility lines or building foundations. People are often concerned about the effects blasting may have on their home. Blasting may cause your home to shake. The effects of blasting may rattle windows, dishes and pictures hung on the wall. However, blasting conducted within Pennsylvania's regulatory limits will not damage your home.

ROLE OF THE PENNSYLVANIA DEP:

The Pennsylvania Department of Environmental Protection (DEP) is responsible for regulating the storage, handling and use of explosives in the Commonwealth. This includes blasting at coal mines, quarries, construction sites and demolition blasting. DEP explosives regulatory personnel work within either the Bureau of District Mining Operations or the Bureau of Mining and Reclamation. They regulate the following aspects of blasting:

Blaster's Licenses

Before conducting blasting operations, a blaster must obtain a blaster's license. Pennsylvania's blaster's licenses are accepted as blaster certification in many other states and some other countries. Pennsylvania's blaster's licensing program began in the 1950s. To qualify for a Pennsylvania blaster's license, a candidate must have one year of experience under the guidance of a licensed blaster. That experience must be in the type of blasting authorized by the license sought. Categories include General (authorizes blasting in coal mines, quarries and on construction sites), Trenching and Construction, Surface Mining, Underground Industrial Mineral, Demolition and Limited (authorizes use and handling of explosives for law enforcement, industrial and research purposes). The candidate is required to attend a two-day training course provided by DEP and pass an exam specific to the category of license sought. To renew a blaster's license, a blaster must re-attend a DEP-approved training course every three years and comply with Pennsylvania's blasting regulations.

Blasting Permits

All blasting operations in Pennsylvania require a permit. DEP's Blasting and Explosives Inspectors review applications for Blasting Activity Permits. Blasting and Explosives Inspectors are well trained and are licensed blasters. The Blasting Activity Permit application must include information that demonstrates, with a reasonable degree of certainty, that the blasting activity proposed can be conducted safely and within the bounds of Pennsylvania's blasting regulations.

Explosives Storage Licenses

Explosives must be stored in explosives magazines approved and licensed by DEP. As with Blasting Activity Permits, Storage License applications are reviewed by Blasting and Explosives Inspectors. The Explosives Storage License application must include information that demonstrates, with a reasonable degree of certainty, that the explosives storage proposed can be conducted within the bounds of Pennsylvania's blasting regulations. DEP shares regulations for safely locating magazines, constructing magazines and classifying explosives with U.S. Department of Justice, Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF).

Blasting Regulations that Protect the Public

Pennsylvania's blasting regulations were implemented to provide protection to people and property beyond the blast site as well as protection to personnel on the blast site. Performance standards are set to minimize the adverse effects of blasting to protect people and property. For example:

- Flyrock is prohibited. Flyrock is rock, dirt or other debris that is blown from the blast site during a blast. Blasts must be designed to minimize the risk of flyrock to reduce the chances of injury or property damage. In addition, the blast area - the area surrounding the blast site - must be secured so people will not be injured in the event that flyrock is produced.
- Gases generated by blasting must not affect public health and safety. The regulations specify steps that must be taken to prevent adverse effects on people from these types of gases.
- Strict limitations are placed on airblast, an airborne vibration wave resulting from a blast. This wave energy is characterized by its intensity, measured in decibels, and by its frequency, measured in hertz.

- **Wave Intensity:** Airblasts typically diminish in intensity as distance from the blast increases. The intensity of an airblast must not exceed 133 decibels. This widely accepted limit was established through scientific research by the former U.S. Bureau of Mines to reduce annoyance and prevent property damage. An airblast at levels below the legal limit can cause your home to shake. However, airblast levels must be well above the legal limit to damage your home. Windows are the structural components of homes that are most vulnerable to damage from an airblast.
- **Wave Frequency:** Airblasts produced by most blasting operations usually have a frequency of less than 20 hertz, which is below the limit of human hearing. Sometimes blasts result in frequencies higher than 20 hertz and can be heard. It is important to note, however, that one's ability to hear a blast has little, if anything, to do with the blast's ability to damage property because even though it may be heard, it may not have the intensity required to damage property. Therefore, blasts that the public may think are quite loud may not be able to produce damage.

Seismograph monitoring is necessary to properly assess airblasts from blasting. Blasting seismographs measure both ground vibration and – because they're equipped with special sensors – airblasts as well.

- **Ground vibration is limited.** Ground vibration is wave energy transmitted through the ground as a result of a blast. Permanent movement or permanent displacement of the ground only occurs in the immediate area of the blast, about 15 feet or so from where the explosives are placed. Ground vibration, like airblast, is limited to a widely accepted safe level established through scientific research by the former U.S. Bureau of Mines to reduce annoyance and prevent property damage. Ground vibration also decreases as distance from the blast increases. Ground vibration is characterized by its intensity, peak particle velocity (or how fast a particle in the ground will move as a result of the blast, expressed as inches per second) and its frequency. Houses are affected more by lower frequency ground vibrations at a given peak particle velocity. Therefore, Pennsylvania's ground vibration limit requires very limited peak particle velocities at lower frequencies. Ground vibration at levels below the legal limit can cause your home to shake, however, the conservative regulatory limit is set to prevent cosmetic damage to plaster walls. Major cracking of interior walls, foundation damage, or other structural damage will not occur unless ground vibration levels exceed the legal limits by a considerable amount. Vibrations from blasting do not last long enough to cause damage from repeated blasting.

At distances beyond about 15 feet from a properly designed blast it is unlikely that portions of buildings that are in or on the ground, such as foundations or cement slabs, will be damaged. This is due to a home or other building responding much like a flagpole that is shaken at its base. There is little movement at the point of attachment to the ground. Most of the movement is at the top. The movement at the bottom is amplified upward through the more flexible upper portions of the structure. Swimming pools, pipelines and underground storage tanks are also not usually susceptible to blast damage from a properly designed blast at distances greater than about 12 feet.

BLASTING COMPLAINTS:

Complaints concerning blasting can be directed to the appropriate DEP District Mining Offices by phone or in writing. The Addresses and phone numbers of the District Mining Offices are:

Greensburg District Mining Office

Armbrust Professional Center
8205 Route 819
Greensburg, PA 15601-0982
724-925-5500

Cambria District Mining Office

286 Industrial Park Road
Ebensburg, PA 15931
814-472-1900

Pottsville District Mining Office

5 West Laurel Boulevard
Pottsville, PA 17901
570-621-3118

Knox District Mining Office

White Memorial Building
P.O. Box 669, Best Avenue
Knox, PA 16232-0669
814-797-1191

Moshannon District Mining Office

186 Enterprise Drive
Phillipsburg, PA 16866
814-342-8200

Complaints concerning blasting can also be directed to DEP by e-mail at: <http://www.dep.state.pa.us/dep/deputate/minres/districts/concerns.htm>.

When directing a complaint to DEP please provide detailed contact information such as complete addresses and phone numbers where you can be reached. In addition, include permit numbers, times, dates and descriptions of the activities that you are concerned with.

For more information, visit www.depweb.state.pa.us, keyword: Mining and Reclamation.