

## CITIZEN'S GUIDE TO EXPLOSIVES REGULATIONS IN PENNSYLVANIA

### INTRODUCTION

If you live near a coal mine, quarry, or construction site, you may notice that they are blasting. Such 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 because blasting may cause their homes 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 or property.

### ROLE OF PENNSYLVANIA'S DEPARTMENT OF ENVIRONMENTAL PROTECTION

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, and construction sites. Explosives are also commonly used for demolition and seismic exploration for oil and gas reserves. The explosives regulatory program is implemented by the Bureau of District Mining Operations and Mining Programs.

#### 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 (which authorizes blasting in coal mines, quarries, and on construction sites), Trenching and Construction, Surface Mining, Underground Industrial Mineral, Demolition, and Limited (which authorizes use and handling of explosives for oil and gas explosives users, industrial and research purposes). The candidate is required to attend a 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 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 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 storage 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 will comply with Pennsylvania's explosives storage 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). In addition, DEP regulations require that stored explosives are secured.

#### 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 propelled from the blast site during a blast that threatens the safety of people or property. Blasts must be designed to minimize the risk of flyrock to reduce the chances of injury or property damage. The area surrounding the blast site, the blast area, must be secured so people will not be in harm's way.
- Gases generated by blasting must not affect public health or safety. The regulations specify steps that may be taken to prevent adverse effects on people from gases generated by blasting.

- Ground vibration is also limited. Ground vibration is 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 in a typical blast. Ground vibration is limited to a safe level established through scientific research by the former U.S. Bureau of Mines to reduce annoyance and prevent property damage. Ground vibration typically decreases as distance from the blast increase. Ground vibration is characterized by its intensity, peak particle velocity (in inches per second), and its frequency. Houses are affected more by lower frequency ground vibrations at a given peak particle velocity. Therefore, Pennsylvania's regulatory ground vibration limit requires lower 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.
- Airblast is also subject to regulatory limits. Airblast is airborne vibration energy resulting from a blast. This energy is characterized by its intensity (measured in decibels) and its frequency. Airblast typically diminishes in intensity as distance from the blast increases. The intensity of 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. 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 parts of homes that are most vulnerable to damage from airblast. Airblast produced by many blasting operations may have a frequency of less than 20 hertz, which is below the limit of human hearing. Sometimes airblast has 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 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 and ground vibration from blasting. Blasting seismographs measure both ground vibration and – because they're equipped microphones – airblasts as well. When blasting is conducted in the vicinity of homes or other structures seismograph monitoring is required.

## **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:

### **New Stanton District Mining Office**

P.O. Box 133  
New Stanton, PA 15672  
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

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.dep.pa.gov](http://www.dep.pa.gov).