



ADMINISTRATIVE RULES OF MONTANA



17.24.159 BLASTING OPERATIONS: ORDERS OF THE DEPARTMENT

- (1) If the department determines that the preponderance of evidence indicates that property damage or safety hazards are or were caused by blasting associated with exploration or mining activities by an operator, the department shall issue an order. In the event the order is not complied with, the department shall issue an order imposing requirements reasonably necessary to prevent property damage or safety hazards.
- (2) The department may require as many of the following requirements as are reasonably necessary for this purpose:
 - (a) Each operator shall comply with all applicable state and federal laws in the use of explosives.
 - (b) All blasting operations must be conducted by experienced, trained, and competent persons who understand the hazards involved.
 - (c) A record of each blast occurring over a period to be determined by the department, including seismograph records, must be prepared and retained for at least three years and must be available for inspection by the department on request. Blasting records must be accurate and completed in a timely fashion. The records must contain the following data:
 - (i) name of the operator conducting the blast;
 - (ii) location, date, and time of the blast;
 - (iii) name, signature, and, if applicable, license number and appropriate certification program name of blaster-in-charge;
 - (iv) direction and distance, in feet, to the nearest inhabited building or structure either:
 - (A) not located in the permit area; or
 - (B) not owned nor leased by the person who conducts the mining activities;
 - (v) weather conditions, including temperature, wind direction and approximate wind velocity;
 - (vi) type of material blasted;
 - (vii) number of holes, burden, and spacing;
 - (viii) diameter and depth of holes;
 - (ix) types of explosives used;
 - (x) total weight of explosives used;

- (xi) maximum weight of explosives detonated within any eight-millisecond period;
 - (xii) maximum number of holes detonated within any eight-millisecond period;
 - (xiii) initiation system;
 - (xiv) type and length of stemming;
 - (xv) mats or other protections used;
 - (xvi) type of delay detonator and delay periods used;
 - (xvii) sketch of the delay pattern;
 - (xviii) number of persons in the blasting crew;
 - (xix) seismographic and airblast records, where required, including:
 - (A) the calibration signal of the gain setting or certification of annual calibration;
 - (B) seismographic reading, including exact location of seismograph and its distance from the blast, airblast reading, dates and times of readings;
 - (C) name of the person taking the seismograph reading; and
 - (D) name of the person and firm analyzing the seismographic record.
 - (d) When blasting is conducted in an area where access is not restricted, warning and all-clear signals of different character that are audible at all points within a range of 1/2 mile from the point of the blast must be given. Each person within the permit area and each person who resides or regularly works within 1/2 mile of the permit area must be notified of the meaning of the signals through appropriate instructions. These instructions must be periodically delivered or otherwise communicated in a manner that can be reasonably expected to inform such persons of the meaning of the signals.
 - (e) Blasting must not eject flyrock off property controlled by the operator. Access to the blasting area and to areas where blasting effects, such as flyrock, occur, must be controlled by methods such as signs and fencing to prevent the presence of livestock or unauthorized personnel during blasting and until an authorized representative of the operator has reasonably determined:
 - (i) that no unusual circumstances, such as imminent slides or undetonated charges, exist; and
 - (ii) that access to and travel in or through the area can be safely resumed.
 - (f) The operator shall comply with the following to control airblast:
 - (i) Airblast must be controlled so that it does not exceed the values specified below at any dwelling, public building, school, church, or commercial, public, or institutional structure, unless the structure is owned by the operator and is not leased to any other person. If a building owned by the operator is leased to another person, the lessee may sign a waiver relieving the operator from meeting the airblast limitations of this section.
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Lower Frequency limit of <u>measuring system, Hertz (Hz) (+3dB)</u>	Maximum level in <u>decibels (dB)</u>
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0.1 Hz or lower - flat response	134 peak.
2 Hz or lower - flat response	133 peak.
6 Hz or lower - flat response	129 peak.
C-weighted, slow response	105 peak dBC.

If necessary to prevent damage based upon the consultant's report, the department shall specify lower maximum allowable airblast levels than those above.

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- (ii) In all cases, except the C-weighted, slow-response system, the measuring systems used must have a flat frequency response of at least 200 Hz at the upper end. The C-weighted system must be measured with a Type 1 sound level meter that meets the standard American National Standards Institute (ANSI) S 1.4-1983 specifications. These specifications are incorporated by reference. Copies of this publication are on file with the Department of Environmental Quality, P.O. Box 200901, Helena, MT 59620-0901.
 - (iii) The operator may satisfy the provisions of this subsection by meeting any of the four specifications in the chart in (i).
 - (iv) The operator shall conduct periodic monitoring to ensure compliance with the airblast standards. The department may require an airblast measurement of any or all blasts, and may specify the location of such measurements, except as noted in (i).
 - (g) Whenever the standards contained in (k)(i) and (o)(iii) have been exceeded, or whenever, based upon the consultant's report, it has been determined to be necessary to protect public safety or property, the department may require modification of blasting activities to protect:
 - (i) public, private or institution building, including any dwelling, school, church, hospital, or nursing facility; and
 - (ii) facilities including, but not limited to, disposal wells, petroleum or gas storage facilities, municipal water storage facilities, fluid transmission pipelines, gas or oil collection lines, or water and sewage lines or any active or abandoned underground mine.
 - (h) A blast design, including measures to protect the facilities in (g) must be submitted to the department prior to continued blasting.

- (i) Flyrock, including blasted material traveling along the ground, must not be cast from the blasting vicinity more than half the distance to the nearest dwelling or other occupied structure and in no case beyond the line of property owned or leased by the permittee, or beyond the area of regulated access required under (e).
- (j) Blasting must be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of ground or surface waters outside the permit area.
- (k)
 - (i) In all blasting operations, except as otherwise authorized in this subsection, the maximum peak particle velocity must not exceed the following limits at the location of any dwelling, public building, school, church, or commercial, public, or institutional structure:

Distance (D) from the blasting site, in feet	Maximum allowable peak particle velocity (V max) for ground vibration, in inches/ second	Scaled-distance factor to be applied without seismic monitoring (Ds)
0 to 300	1.25	50
301 to 5,000	1.00	55
5,001 and beyond	0.75	65

- (ii) Peak particle velocities must be recorded in three mutually perpendicular directions. The maximum peak particle velocity is the largest of any of the three measurements.
 - (iii) The department shall reduce the maximum peak velocity allowed if a lower standard is required, based upon the consultant's report, to prevent damage or to protect public safety because of density of population or land use, age or type of structure, geology or hydrology of the area, frequency of blasts, or other factors.
- (l) If blasting is conducted in such a manner as to avoid adverse impacts on any underground mine and changes in the course, channel, or availability of ground or surface water outside

the permit area, then the maximum peak particle velocity limitation of (k) does not apply at the following locations:

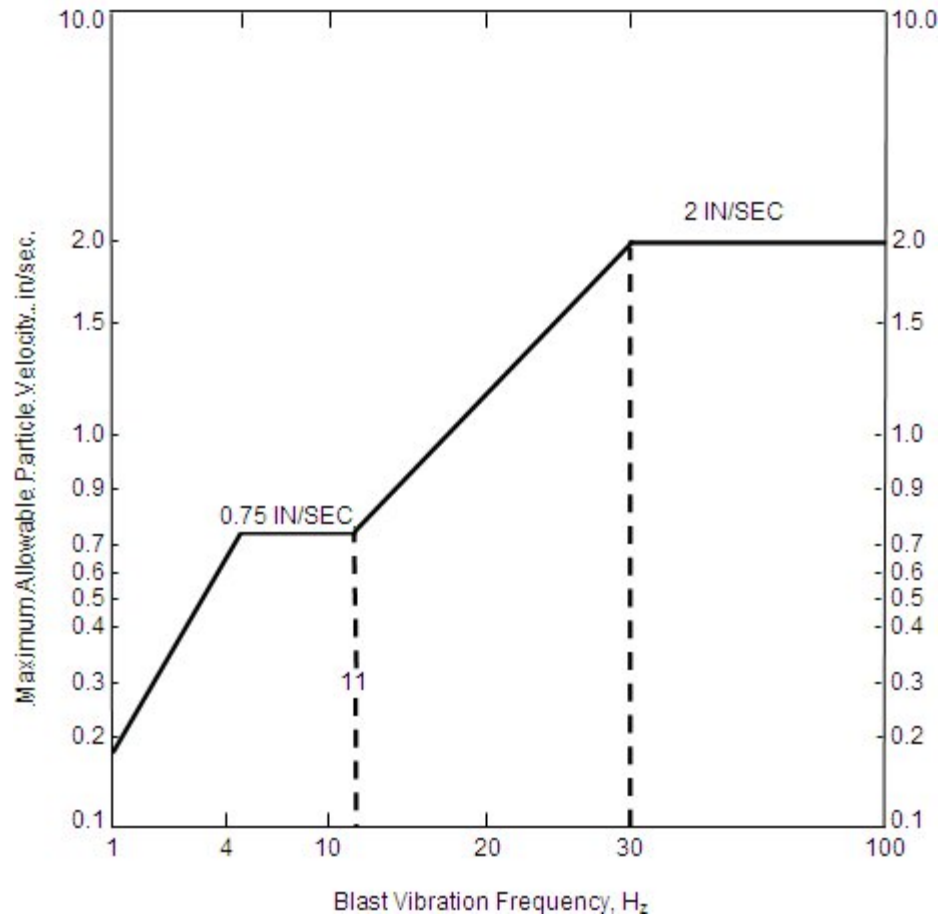
- (i) at structures owned by the operator and not leased to another party; and
 - (ii) at structures owned by the operator and leased to another party, if a written waiver by the lessee is submitted to the department prior to blasting.
- (m) An equation for determining the maximum weight of explosives that can be detonated within any eight-millisecond period is in (n) . If the blasting is conducted in accordance with this equation, the peak particle velocity is deemed to be within the limits specified in (k).
- (n) The maximum weight of explosives to be detonated within any eight-millisecond period may be determined by the formula

$W=(D/D_s)^2$ where W=the maximum weight of explosives, in pounds, that can be detonated in any eight-millisecond period; D=the distance, in feet, from the blast to the nearest public building or structure, dwelling, school, church, or commercial or institutional building or structure, except as noted in (l) ; and D_s=the scaled distance factor, using the values identified in (k).

(o)

- (i) Whenever a seismograph is used to monitor the velocity of ground motion and the peak particle velocity limits of (k) are not exceeded, the equation in (n) need not be used. If that equation is not used by the operator, a seismograph record must be obtained for each shot.
- (ii) The use of a modified equation to determine maximum weight of explosives per delay for blasting operations at a particular site may be approved by the department, on receipt of a petition accompanied by reports including seismograph records of test blasting on the site. The department may not approve the use of a modified equation if the peak particle velocity for the limits specified in (k) are exceeded, meeting a 95% statistical confidence level.
- (iii) The operator may use the ground vibration limits in Figure 1 (30 CFR 816.67(d)(4)) as an alternative to (i) and (ii), upon approval by the department.

Figure 1: Blasting Level Chart



- (iv) The department may require a seismograph record of any or all blasts and may specify the location at which the measurements are to be taken.

Authorizing statute(s): 82-4-321, MCA

Implementing statute(s): 82-4-356, MCA

History: NEW, 1990 MAR p. 1470, Eff. 7/27/90; TRANS, from DSL, 1996 MAR p. 2852; AMD, 1999 MAR p. 640, Eff. 4/9/99; AMD, 2024 MAR p. 1060, Eff. 5/11/24.