



Ohio Administrative Code

Rule 1501:13-9-06 Use of explosives in coal mining and coal exploration operations.

Effective: June 28, 2018

(A) General.

(1) The provisions of this rule shall apply to all surface blasting operations, including surface blasting operations incident to underground mining, on all coal mining and reclamation operations and on coal exploration operations. For box or contour cuts associated with development of underground mine entries, this rule shall apply to all material above the coal seam to be mined. For vertical shafts and drift or slope entries associated with underground mining, this rule shall apply only to the first twenty-five feet of material excavated below or beyond the original ground surface or point of entry. Where the provisions of this rule are in conflict with the conditions described in a permittee's previously approved blasting plan, the provisions of this rule shall apply.

(2) Blasting operations shall be conducted in accordance with all applicable state and federal laws and regulations.

(3) For purposes of this rule, "certified blaster" shall mean a blaster who possesses a valid certificate obtained pursuant to rule 1501:13-9-10 of the Administrative Code and "certified mine foreperson" shall mean a mine foreperson who has a valid certification pursuant to Chapter 1561. of the Revised Code.

(4) Blasting operations shall be conducted only under the supervision of a certified blaster. A certified blaster and at least one other person shall be physically present at the detonation of a blast. Only a certified blaster, or a member of the blasting crew under the direct supervision of the certified blaster, may detonate a blast. Any certified blaster who is responsible for conducting blasting operations at a blasting site shall give direction and on-the-job training to persons who are not certified and who are assigned to the blasting crew or assist in the use of explosives.

(5) Certified blasters, and other persons responsible for blasting operations at a blasting site, shall review and know the permittee's blasting plan and site-specific blasting limitations. The permittee



shall keep a copy of the blasting plan and the permit map at the permit site or at the mine office closest to the permit site for use by employees, contract blasters, and any other persons responsible for blasting operations.

(B) Anticipated blast design for special areas.

(1) The permittee or permit applicant must submit an anticipated blast design to the chief before blasting within:

(a) One thousand feet of any dwelling, public or commercial building, school, church, or community or institutional building; or

(b) Five hundred feet of an active or abandoned underground mine.

(2) The blast design must be submitted:

(a) As part of a permit application; or

(b) As a revision to the mining plan, at least sixty days prior to such blasting.

(3) The blast design shall contain sketches of the drill patterns, delay periods, and decking, and shall indicate the type and amount of explosives to be used, critical dimensions, initiation systems, and the location and general description of structures to be protected, as well as a discussion of design factors to be used, which protect the public and meet the applicable flyrock, airblast, and ground vibration standards in paragraph (F) of this rule.

(4) The blast design shall be prepared by a certified blaster or by a blasting consultant, seismologist, or professional engineer who has been trained in current blasting technology and state and federal blasting laws and regulations. The blast design shall be reviewed, approved, and signed by a certified blaster who has knowledge of the site-specific blasting limitations.

(5) The chief may require revisions to the design submitted.



(C) Preblast survey.

(1) At least thirty days before initiation of blasting, the permittee or permit applicant shall notify, in writing, all residents or owners of dwellings or other structures located within one-half mile of the permit area, about how to request a preblast survey. Such notification shall include the statements that any preblast survey requested more than ten days before the planned initiation of blasting shall be completed before the initiation of blasting, and that the survey will be conducted at no cost to the resident or owner.

(2) A resident or owner of a dwelling or structure within one-half mile of the permit area may request a preblast survey. This request shall be made, in writing, directly to the permittee or permit applicant by certified mail, or by regular mail to the chief, who shall promptly notify the permittee or permit applicant by certified mail or by electronic mail with acknowledgment of receipt. Within forty-five days after a request is received, the permittee or permit applicant shall conduct a preblast survey of the dwelling or structure and prepare a written report of the survey. Where blasting has not yet begun on a new or proposed permit area, a modified time frame for completion of preblast surveys may be approved by the chief, upon written request to the chief, when circumstances warrant an extension of time. However, any preblast survey requested more than ten days before the planned initiation of blasting shall be completed before the initiation of blasting. An updated survey of any additions, modifications, or renovations shall be performed by the permittee or permit applicant if requested by the resident or owner.

(3) When conducting a preblast survey, the permittee or permit applicant shall determine the condition of the dwelling or structure and shall document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, oil and gas wells, cables, communication and transmission towers, transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.

(4) The written report of the survey shall be signed by the person who conducted the survey. Copies of the report shall be provided to the resident or owner of the dwelling or structure, and to the chief. If the resident or owner disagrees with the contents or recommendations contained therein, he or she may submit to both the permittee or permit applicant and the chief a detailed description of the



specific areas of disagreement.

(5) Whenever a permittee or permit applicant conducts a preblast survey of a dwelling or structure without receiving a written request to do so, a copy of the written report of the survey shall be given to the resident or the owner.

(D) Blasting schedule.

(1) Blasting shall be conducted between sunrise and sunset at times approved by the chief and announced in the blasting schedule. The chief may limit the time periods, area covered, and sequence of blasting as listed in the schedule, if such limitations are necessary and reasonable in order to protect the public health and safety or welfare.

(2) Unscheduled blasts may be conducted only in emergency situations where rain, lightning, other atmospheric conditions, or operator or public safety so requires. When an unscheduled blast is conducted, the certified blaster in charge shall document the reason for the unscheduled blast in the blast record required under paragraph (G) of this rule.

(3) At least ten days, but not more than ninety days, before initiation of blasting, the permittee or permit applicant shall publish the blasting schedule in a newspaper of general circulation in the locality of the blasting area, and distribute copies of the blasting schedule to local governments, public utilities, and each residence and occupied building within one-half mile of the proposed blasting area described in the schedule. A notarized proof of each publication of the blasting schedule required under this rule shall be sent to the division of mineral resources management district office having jurisdiction over the permit.

(4) The permittee shall republish and redistribute the schedule at least every twelve months, and revise, republish, and redistribute the schedule at least ten days, but not more than thirty days, before blasting whenever the area covered by the schedule changes or actual time periods for blasting significantly differ from the prior announcement.

(5) The blasting schedule shall contain, at a minimum:



- (a) Name, address, and telephone number of the permittee or permit applicant;
 - (b) Permit number or application number, whichever is applicable;
 - (c) Identification of the specific areas where blasting will occur;
 - (d) Dates and time periods when blasting will occur;
 - (e) Methods to be used to control access to the blasting area;
 - (f) Type and patterns of audible warning and all-clear signals to be used before and after blasting;
and
 - (g) A description of possible emergency situations (defined in paragraph (D)(2) of this rule) when an unscheduled blast may be necessary.
- (6) Surface blasting incident to underground mining shall be exempt from the blasting schedule and publication requirements of paragraphs (D)(3), (D)(4), and (D)(5) of this rule if, instead, the underground mine permittee or permit applicant provides notice, in writing, to residents within one-half mile of the blasting site and local governments of the proposed times and locations of blasting operations. Such notice of blasting times and locations may be announced weekly, but in no case less than twenty-four hours before blasting will occur.
- (E) Blasting signs, warnings, and access control.
- (1) Blasting signs shall meet the specifications of rule 1501:13-9-01 of the Administrative Code.
 - (2) The permittee shall conspicuously place signs reading "BLASTING AREA" along the edge of any blasting area that comes within one hundred feet of any public road right-of-way, and at the edge of blasting areas along access and haul roads within the permit area.
 - (3) At all entrances to the permit area from any road, the permittee shall conspicuously place signs which state "WARNING! EXPLOSIVES IN USE" which clearly explain the meaning of the audible



warning and all-clear signals in use, and the marking of blasting areas and charged holes awaiting firing within the permit area.

(4) For each blast, the certified blaster conducting the blast shall determine the limits of the blasting area and communicate those limits to the certified mine foreperson. The certified mine foreperson shall be responsible for controlling access to the blasting area to prevent the presence of livestock or unauthorized persons at least ten minutes before each blast, and until the certified blaster has determined that no unusual hazards, such as imminent slides or undetonated charges, exist, and access to and travel within the blasting area can safely resume. The certified mine foreperson shall not allow anyone to re-enter the designated blasting area until the certified blaster conducting the blast has contacted the certified mine foreperson, and the all-clear signal has been sounded. "Blasting area" means the area in which airblast (concussion or shock wave), flyrock, or other blasting hazards might cause injury to persons or damage to property. In determining the blasting area, the following factors shall be considered:

- (a) Geology of the material to be blasted;
- (b) Orientation of the blast bench and rock face(s);
- (c) Blast pattern layout, delay system and timing;
- (d) Burden, depth, diameter and angle of the blastholes;
- (e) Blasting experience of the mine;
- (f) Powder factor and pounds of explosives per delay;
- (g) Type and amount of explosive material;
- (h) Type and amount of stemming;
- (i) Atmospheric conditions; and



(j) Topography.

(5) At least one minute, but not more than two minutes, before the detonation of a blast, the certified blaster in charge, or someone directed by the certified blaster, shall give an audible warning signal. If the blast is not detonated within two minutes of the audible warning signal, the warning signal shall be repeated as required by this paragraph before the blast is detonated. After the blast has been detonated and the certified blaster has confirmed that the blast area is safe to re-enter, an audible all-clear signal shall be given.

(6) Warning and all-clear signals, to be produced by an airhorn, siren or similar device, shall be audible to at least one-half mile from the blast site. "Blast site" means the area formed by the perimeter of the loaded blastholes and fifty feet in all directions from loaded blastholes. The warning signal shall consist of three long sounds, each lasting at least five seconds. The all-clear signal shall consist of one long sound lasting at least ten seconds.

(7) When blasting within one-half mile of any public or private institution such as a school or church in session, or a residential mental or physical health care facility, the permittee shall notify the institution by telephone or personal visit on the day of scheduled blasting at least one hour before each blast. This requirement shall not apply if the permittee submits to the chief a copy of a statement signed by the administrator of the institution, waiving the right to be notified.

(F) Control of adverse effects.

(1) Blasting shall be conducted in a manner 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 surface or ground water outside the permit area.

(2) Blasting shall not be conducted within:

(a) Three hundred feet of any public water tower or public reservoir dam, communication or high-voltage transmission tower, railroad tunnel or highway tunnel, public water or sewage line, or major oil or gas pipeline, except where written permission has been obtained from the controlling authority or owners thereof on a form prescribed by the chief or a letter attached to that form; or



(b) Five hundred feet of an active underground mine, except where written permission has been obtained from the owners thereof, and from all state and federal regulatory authorities concerned with the health and safety of underground miners, on a form prescribed by the chief or a letter attached to that form.

(3) "Flyrock," defined as rock, mud, or debris (excluding dust) traveling in the air or along the ground as a result of a blast, shall not be cast from the blast site beyond any of the following:

(a) One-half the horizontal distance to any dwelling or other occupied structure;

(b) The area of control required under paragraph (E)(4) of this rule; or

(c) The permit boundary.

(4) If flyrock is cast beyond the permit boundary, the certified blaster in charge shall notify the division of mineral resources management by telephone within two hours after learning of the flyrock incident, and submit a written flyrock incident report to the division of mineral resources management district office having jurisdiction over the permit area within three business days after learning of the incident. The permittee or certified blaster shall not conduct another blast directly beside or behind the blast site where the flyrock originated until the report is properly completed and the division of mineral resources management has acknowledged its receipt. The report shall include, at a minimum, a copy of the blast record required under paragraph (G) of this rule and all available seismographic data, a sketch of the blast site and rock deposition area, and a detailed explanation of: how the blast was designed and loaded; who witnessed the blast and where they were located and what they observed; the location and nature of the flyrock deposition (including property owners, type and approximate number of rocks, size and distance range), property damages (if any) and personal injuries (if any); what measures have been taken to repair all property damages (if any) and address all personal injuries (if any); the probable cause of the flyrock incident; and the corrective measures to be taken to prevent another flyrock incident.

(5) Airblast shall not exceed one hundred thirty-three decibels at any dwelling, public or commercial building, school, church, or community or institutional building outside the permit area, except as



authorized under paragraph (F)(12) of this rule.

(a) If necessary to prevent damage, the chief shall specify lower maximum allowable airblast levels for use in the vicinity of a specific blasting operation.

(b) The permittee shall conduct periodic monitoring to ensure compliance with the airblast limits. The chief may require airblast measurement of any or all blasts, and may specify the locations at which such measurements are taken.

(6) In all blasting operations, except as authorized in paragraph (F)(12) of this rule, the maximum ground vibration shall not exceed the values specified in this rule or approved in the blasting plan required under paragraph (C) of rule 1501:13-4-05 or paragraph (C) of rule 1501:13-4-14 of the Administrative Code.

(a) The maximum ground vibration at any dwelling, public or commercial building, school, church, or community or institutional building outside the permit area shall be established in accordance with the frequency-dependent particle velocity limits of paragraph (F)(8) of this rule, or other limits imposed by the chief pursuant to paragraph (F)(10) of this rule.

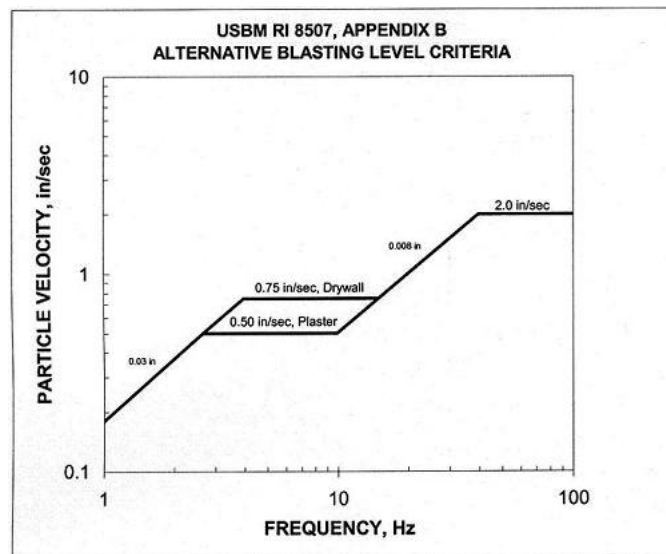
(b) All other structures in the vicinity of the blasting area not listed in paragraph (F)(6)(a) of this rule, such as water towers, pipelines and other utilities, communication and transmission towers, tunnels, dams, impoundments, and underground mines, shall be protected from damage by establishment of a maximum allowable limit on the ground vibration, submitted by the permittee in the blasting plan and approved by the chief.

(7) All seismographs used to prove compliance with the ground vibration and airblast limits required by this rule shall have seismic and acoustic systems with a minimum frequency range of two to two hundred fifty hertz, with accuracies that meet or exceed the performance specifications for blasting seismographs adopted by the international society of explosives engineers, "ISEE Performance Specifications for Blasting Seismographs 2017," available as a digital download from the "International Society of Explosives Engineers" at the website www.isee.org. The ground vibration shall be measured as the particle velocity and recorded in three mutually perpendicular directions. The maximum allowable frequency-dependent particle velocity limits and peak particle velocity



limits in this rule shall apply in each of the three directions of measurement. Whenever possible, the seismographic measurement shall be made within ten feet of the building or structure being monitored, at the side or corner of the building or structure closest to the blast site. Otherwise, the seismograph may be placed at some point between the blast site and the building or structure to be protected.

(8) Ground vibration, when measured at any dwelling, public or commercial building, school, church or community or institutional building outside the permit area, shall not exceed the frequency-dependent particle velocity limits in the chart, below, from the U.S. bureau of mines (1980), "Report of Investigations 8507, Appendix B: Alternative Blasting Level Criteria." When applying the frequency-dependent particle velocity limits, the lower plateau at 0.50 inches per second shall apply at its corresponding frequencies, unless the permittee or permit applicant submits to the chief evidence to support application of the higher plateau at 0.75 inches per second, and the chief approves a blast plan modification to that effect.



(9) In lieu of the seismographic monitoring required by paragraph (F)(8) of this rule, the scaled distance equation, $W = (D/90)^2$, may be used to determine the maximum allowable charge weight of explosives that can be detonated within any period less than eight milliseconds, where W = the maximum weight of explosives, in pounds; D = the distance, in feet, from the nearest blasthole to the nearest dwelling, public or commercial building, school, church, or community or institutional building outside the permit area; and 90 is the applicable scaled distance factor.



(10) The chief shall reduce the maximum allowable ground vibration limits prescribed in paragraph (F)(8) of this rule, if determined necessary to prevent damage.

(11) The chief may require a permittee to conduct seismic monitoring of any or all blasts, and may specify the location at which the measurements are taken and the degree of detail necessary in the measurement.

(12) The maximum airblast and ground vibration limits of paragraphs (F)(5) to (F)(8) of this rule shall not apply:

(a) At structures owned by the permittee and not leased to another person; and

(b) At structures owned by the permittee and leased to another person, if a written waiver by the lessee is submitted to the chief before blasting.

(13) Any person who operates a seismograph for the purpose of demonstrating compliance with the ground vibration and airblast limits of this rule shall have received appropriate training, for the specific seismograph model(s) in use, in: programming the seismograph(s) to record the blast; positioning the geophone and microphone; coupling the geophone to the ground; extracting the data after the blast in digital and printed form; and understanding the results. Such training shall be received from a representative of the seismograph manufacturer or distributor, or other competent person. A record of such training shall be maintained by the seismograph operator or his or her employer, and made available for inspection by the chief or his or her authorized representative upon request.

(G) Blast records.

(1) The permittee shall retain a record of all blasts for at least three years, and shall make copies of these records available for inspection upon request by the public, the chief or an authorized representative of the chief.

(2) Where blast records are normally kept at an office of the permittee not located on the permit site, the record for each blast shall be on file at that office within five business days after the blast is



detonated.

(3) Blast records shall be accurately completed at the mine site by the certified blaster in charge, and shall contain the following data:

(a) Name of the permittee and permit number;

(b) Name of the firm conducting the blast, if different from the permittee;

(c) Location, date, and time of the blast;

(d) Printed name, signature, and certification number of the blaster conducting the blast and the name of each person on the blasting crew;

(e) Relative to the nearest blasthole, the identification of, distance to, direction to, and method used to determine the distance and direction to, the nearest dwelling, public or commercial building, school, church, or community or institutional building outside the permit area, except those structures described in paragraph (F)(12) of this rule. The direction shall be stated in degrees, as an azimuth from zero to three hundred sixty degrees. The distance shall be stated in feet, as derived from an aerial photo, a topographic map, conventional field measurement devices (e.g., measuring tape or transit), or electronic devices (e.g., laser-ranging or global positioning system units);

(f) Weather conditions, including temperature and approximate wind direction and velocity;

(g) Type of material blasted;

(h) Number, diameter, and depth of holes;

(i) Depth of subdrilling, where applicable;

(j) Burden and spacing dimensions;

(k) Type, manufacturer, and amount of explosives used, including bulk, bagged, or cartridge



explosives, detonating cord, primers, and surface and in-hole delay detonators;

(l) Total weight of explosives used;

(m) Weight of explosives used per hole;

(n) Maximum number of holes and maximum weight of explosives detonated within any period less than eight milliseconds;

(o) The actual scaled distance factor, expressed as the distance, in feet, from the nearest blasthole to the nearest dwelling or building in paragraph (G)(3)(e) of this rule divided by the square-root of the maximum weight of explosives detonated in any period less than eight milliseconds;

(p) Type of initiation system used, including the type of blasting machine or other power source, and the types of trunkline and downline systems, if not readily apparent from other information in the blast record;

(q) Sequential timer setting, in milliseconds, if applicable;

(r) Type and length of stemming used per hole;

(s) Sketch of the blast pattern showing all holes, delay pattern (including initiation hole, hole-to-hole and row-to-row delay detonator locations and periods, where applicable, or electronically programmed hole and deck firing times, where applicable), location of free faces and previously blasted material, and a north arrow;

(t) Sketch of a typical blasthole cross section showing the depth and location of stemming and explosive decks, primers, and delay detonators;

(u) Mats or other special protections used;

(v) Seismographic records, when required for compliance, shall be attached to the blast record within five business days of the blast, and shall include:



- (i) Make, model and serial number of the seismograph, seismic and acoustic trigger levels, and most recent annual calibration date;
 - (ii) Exact location of the seismograph and distance from the blast, and the date and time of the recorded blast event;
 - (iii) Name of the person and firm operating the seismograph;
 - (iv) Full waveform printout, including: three mutually perpendicular channels of ground vibration and an airblast channel; dynamic calibration results; a plot of particle velocity versus frequency with a comparison to the frequency-dependent blast vibration limits in paragraph (F)(8) of this rule, based on a half-cycle zero-crossing analysis method; and the peak particle velocity and airblast levels; and
 - (v) If the seismograph fails to be triggered by the blast, a printout showing the date and time the seismograph was armed and ready to record a blast and the date and time the seismograph was disarmed or shut down, or a written statement including the above information, signed by the seismograph operator and attached to the blast record; and
 - (w) Reasons and conditions for each unscheduled blast.
- (4) When bulk-loaded explosives are used, blast record data required by paragraphs (G)(3)(k) to (G)(3)(n) of this rule shall be completed as soon as the exact quantity of bulk explosives is determined, but in no case more than twenty-four hours after the blast is detonated.