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— Ground Vibration Limits
— Blast Plans.

ANTICIPATED BLAST DESIGN

Part III

Department of the Interior

Office of Surface Mining Reclamation and Enforcement

Surface Coal Mining and Reclamation Operations; Initial and Permanent Regulatory Programs; Use of Explosives

DEPARTMENT OF THE INTERIOR

Office of Surface Mining Reclamation and Enforcement

30 CFR Parts 715, 780, 816, and 817

Surface Coal Mining and Reclamation Operations; Initial and Permanent Regulatory Programs; Use of Explosives

AGENCY: Office of Surface Mining Reclamation and Enforcement, Interior.
ACTION: Final rule.

SUMMARY: The Office of Surface Mining Reclamation and Enforcement (OSM) is amending its rules governing the use of explosives. The rules revise the requirements relating to blasting standards, preblasting surveys, airblast, ground vibration and flyrock, monitoring of blasts, and blast design. Final rules are adopted for the initial regulatory program, and the permanent regulatory program. The rules govern the blasts associated with surface and underground mines. The effect of the rule is to provide increased flexibility to design professionals to meet the regulatory performance standards contained in this rule.

EFFECTIVE DATE: April 7, 1983.

FOR FURTHER INFORMATION CONTACT: Arthur Anderson, Office of Surface Mining, U.S. Department of the Interior, 1951 Constitution Ave., NW., Washington, DC 20240; 202-343-5954.

SUPPLEMENTARY INFORMATION:

- I. Background.
- II. Discussion of Rules Adopted and Responses to Comments.
- III. Procedural Matters.

I. Background.

The Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. 1201 *et seq.* (the Act), sets forth initial regulatory procedures, permit requirements, and performance standards in Sections 502(c), 507(g), and 515(b)(15), respectively, governing the use of explosives in surface coal mining operations. Section 518 provides performance standards governing the surface effects of underground mining. Rules implementing those sections were published by OSM at 42 FR 62639 (December 13, 1977) under the initial regulatory program (30 CFR 715.19) and at 44 FR 14901 (March 13, 1979) under the permanent regulatory program (30 CFR 780.13, 816.11, 816.61-816.68, 817.11, and 817.61-817.68).

In litigation over the initial program rules, the U.S. Court of Appeals for the District of Columbia issued a decision on May 2, 1980. *In re: Surface Mining Regulation Litigation*, 627 F. 2d 1346

(D.C. Cir. 1980). That decision addressed two blasting issues: (1) The 1,000-foot limitation on blasting near houses, schools, and other buildings in § 715.19(e)(1)(vii), and (2) the 1.0-inch-per-second limitation on particle velocity produced by blasting in § 715.19(e)(2)(ii). The court ruled that the 1,000-foot limit was not authorized by Sections 522(e) (4) and (5) of the Act and that the 1.0-inch-per-second vibration limit was arbitrary and capricious because it lacked technical support.

On May 16, 1980, in litigation over the permanent program rules, the U.S. District Court for the District of Columbia remanded the 1,000-foot limitation on blasting in § 816.65(f). *In re: Permanent Surface Mining Regulation Litigation*, No. 79-1144 (D.D.C. May 16, 1980). The court did not invalidate the 1.0-inch-per-second vibration limitation, but at footnote 19 in its opinion the court recognized that the court of appeals had invalidated a similar provision in § 715.19(e)(2)(ii) in the initial program rules. To implement the court's decision, §§ 816.65(f) and 817.65(f) were suspended by notice at 45 FR 51549 (August 4, 1980).

In response to these decisions, amendments to the blasting rules were proposed at 46 FR 6982 (January 22, 1981). These proposed rules were later withdrawn, by notice at 46 FR 32455 (June 23, 1981) to allow OSM to undertake a more general review of all the blasting rules under the permanent regulatory program. On March 24, 1982, OSM proposed to amend many of the rules governing the use of explosives under the initial and permanent regulatory programs (47 FR 12760).

OSM today adopts many of the rules proposed on March 24, 1982. Final rules are adopted with regard to the use of explosives under the initial regulatory program (§ 715.19). Final rules are also adopted under the permanent regulatory program for surface (§§ 816.11 and 816.61-816.68) and underground (§§ 817.11 and 817.61-817.68) mines and with regard to blasting plans (§ 780.13) for surface mines.

II. Discussion of Rules Adopted and Responses to Comments

OSM received numerous comments on the proposed rules. Although public hearings were scheduled to be held in Washington, D.C.; Pittsburgh, Pa.; and Denver, Colo., no one requested the opportunity to speak at any of these hearings; therefore they were not held. Two requests for public meetings were filed. Meetings were held on June 9, 1982, in Washington, D.C., and on May 4, 1982, in Indianapolis, Ind.

Summaries of each of those meetings have been included in the Administrative Record.

The rules adopted today place increased responsibility on design professionals, such as certified blasters and blast vibration experts, in establishing the design standards to meet the regulatory performance standards contained herein. Those operators staying within the approved limits, complying with approved performance standards, and maintaining a responsible relationship with surrounding residents will be able to operate without additional constraint.

Technical References. In promulgating the previous permanent program rules governing blasting, OSM analyzed the technical references which were available through the fall of 1978. Those materials are listed at 44 FR 15179. OSM relied upon those references, as well as the following additional and, in some cases, more recent technical documents in the development of these revised rules:

Bollinger, G. A., 1971, Blast vibration analysis: Southern Illinois University Press, Carbondale and Edwardsville, 132 pp.

Braile, L. W., Sexton, J. L., Martindale, K. W., and Chiang, C. S., 1982, Seismic wave generation and preparation from coal mine blasts at the Wright mine, Warrick County, Indiana: Prepared by Department of Geosciences and Center for Earthquake Engineering and Ground Motion Studies, Purdue University, for U.S. Office of Surface Mining under contract J6211205, 344 pp.

Hemphill, Gary B., 1981, Blasting operations: McGraw-Hill Book Co., New York City, 258 pp.

Medearis, Kenneth, 1976, The development of rational damage criteria for low-rise structures subjected to blasting vibrations: National Crushed Stone Association, Washington, D.C., 94 pp.

Roth, Julius, Britton, K. C., Campbell, R. W., Ketler, W. R., 1977, Evaluation of surface Mining blasting procedures: Prepared by Management Science Associates for U.S. Bureau of Mines under contract J0366017, 152 pp.

Siskind, D. E., Stachura, V. J., Stagg, M. S., and Kopp, J. W., 1980, Structure response and damage produced by airblast from surface mining: U.S. Bureau of Mines Report of Investigations RI8485, 11 pp.

Siskind, D. E., Stagg, M. S., Stachura, V. J., 1979, Safe ground vibration and airblast criteria: 51st Annual Meeting, Eastern Section Seismological Society of America, October 1979, Blacksburg, Va.

Siskind, D. E., Stagg, M. S., Kopp, J. W., Dowding, C. H., 1980, Structure response and damage produced by ground vibration from surface mine blasting: U.S. Bureau of Mines Report of Investigations RI8507, 74 pp.

Stachura, V. J., Siskind, D. E., and Engler, A. J., 1981, Airblast instrumentation and measurement techniques for surface mine blasting: U.S. Bureau of Mines Report of Investigations RI8508, 53 pp.

Stagg, M. S., and Engler, A. J., 1980, Measurement of blast-induced ground vibration and seismograph calibration: U.S. Bureau of Mines Report of Investigations RI8506, 62 pp.

Swedish Detonic Research Foundation, 1978, Annual Report 1978: 14 pp.

U.S. Bureau of Mines, 1971, Blasting vibrations and their effects on structures: Bulletin 656, 105 pp.

Section 715.19

OSM proposed three options for amending 30 CFR 715.19(e)(2), which contains those parts of the initial regulatory program governing ground vibration. OSM is adopting a hybrid of the three options.

Comments on these three options and the ground vibration rule adopted today are discussed later in this rulemaking in conjunction with the rules adopted at § 816.67(d).

In its proposed rule OSM neglected to propose a rule comparable to previous § 715.19(e)(2)(iii), which made the maximum peak-particle-velocity standard inapplicable to property inside the permit area owned or leased by the permittee. In order to correct this oversight, OSM is adopting a new rule at § 715.19(e)(2)(iii), which provides the same exemption as found in the new permanent program rules under § 816.67(e). Previous § 715.19(e)(3) has also been removed and incorporated into § 715.19(e)(2), and previous paragraph (e)(4) has been redesignated as paragraph (e)(3).

One commenter suggested that the rules governing flyrock proposed on March 24, 1982, at §§ 816.67(c) and 817.67(c) should be adopted under the initial regulatory program at Part 715 as well. The commenter pointed out that flyrock should be regulated under the initial regulatory program as well as under the permanent regulatory program. OSM declines to adopt such a change for several reasons. First, OSM believes that flyrock is already regulated by § 715.19(e)(2)(i). Second, the initial regulatory program is of such limited applicability at this time that OSM expects that such a rule would be of limited value. If a compelling reason

for such a rule becomes evident, OSM may, at a later date, determine that it would be useful to propose an initial regulatory program flyrock rule.

Section 780.13

Blasting plans outline the procedures the operator intends to follow in conducting blasting operations. Section 780.13 of 30 CFR requires each application for a permit for a surface coal mine to have a blasting plan, sets standards for blasting plans, and details the information which is to be submitted along with the permit application.

Section 780.13(a) requires the operator to demonstrate in the blasting plan that the operator will achieve the applicable performance standards. In the blasting plan the operator will explain how the performance standards set out in §§ 816.61-816.68 will be achieved. The plan will include information setting the applicable ground vibration and airblast limits and justifying the use of these limits. These limits are discussed more fully in the preamble in relation to § 816.67. The plan must also discuss steps to be taken to control the adverse effects of blasting operations.

Some commenters believed that the blasting plan requires excessive detail in descriptions of limits to be met in protecting structures and the public from damage. Section 507(g) of the Act mandates that an applicant outline in the application the procedures and standards to be used to meet the environmental protection performance standards of Section 515(b)(15) of the Act. Therefore OSM believes the requirement for explanations of the applicable ground vibration and airblast levels is justified.

A commenter requested clarification of the information and explanations required in a blasting plan and suggested that OSM should require identification of sensitive areas, and worst case scenarios." The intent of these rules is to provide nationwide requirements for blasting plans as required by the Act. OSM does not believe that it is necessary specifically to require identification of sensitive areas and worst case scenarios in the blasting plan. The blasting plan must be sufficient in any case to demonstrate compliance with the applicable performance standards and the blasting plan may include such information as appropriate. Additionally, this information may be required under a State program in every case if deemed appropriate by the State regulatory authority. The commenter also felt that an explanation of how the applicant will meet the performance standards should be required. Such an explanation is

required by the last sentence of § 780.13(a).

A commenter objected to the fact that no blasting plan is required for underground operations. Because of the generally limited extent of surface blasting associated with the underground mining, OSM does not believe it is necessary to require a blasting plan for underground operations. OSM's existing rules do not require blasting plans for underground mines nor has OSM proposed to require such plans. Accordingly, no requirement for an underground mining blasting plan is adopted today. However, the rules adopted today do require the submission of some information (specifically blast designs) prior to certain surface blasts incidental to underground mining. See the discussion accompanying § 817.61(d).

A commenter recommended that OSM require the inclusion in the blasting plan of details such as: (1) The names of certified blasters who will be supervising blasting, (2) lists of structures near blast sites, and (3) a copy of the blasting schedule in the blasting plan. OSM acknowledges that this information could be useful in some instances, but believes that this information is not always necessary to decide whether to issue a permit. In any event, this information will become available prior to blasting. (See §§ 816.61, 817.61, 816.68 and 817.68 for information on certified blasters and lists of structures; §§ 816.64 and 817.64, on blasting schedules; and § 779.24(d), on location of buildings and identification of their current use.) Moreover, regulatory authorities who desire additional information incidental to permitting may require it.

Commenters indicated concern about the lack of a requirement in § 780.13(a) for a certified blast design in all blasting plans and the identification of a certified blaster who is in charge of all blast plans. As to the latter comment, a certified blaster is required for all blasting operations. Identification of a specific certified blaster in the blasting plan would not influence the regulatory authority's decision to issue a permit and would unnecessarily reduce operator flexibility.

OSM rejects the suggestion that a certified blast design be required in all blasting plans. Such detail is unnecessary to assure safe blasting and is unnecessary for the regulatory authority to determine that the blasting will be conducted in accordance with the performance standards. It would be difficult or impossible to require and review blast design for every blast

which will occur. Some conditions are unknown at the time of permitting, and operators need flexibility to design blasts for conditions as they are encountered. Absence of a certified blast design in the blasting plan will not allow unrestricted blasting. The blasting plan must show the general approach to all blasts and how all performance standards set out in §§ 816.67 and 817.67 will be met. In addition, for some sensitive areas more complete analyses, including blast designs, must be submitted as required by new § 816.61(d).

~~Comments were received regarding OSM's proposed change to allow for blasting plan submissions at a time other than permit application.~~ Commenters were concerned that this would limit the opportunity to comment on blasting plans. No such result is intended. As discussed below, ~~OSM intends to allow later submission of certain blast designs, but these will not be considered to be part of the blasting plan.~~ Although regulatory authorities could receive comments on blast designs, the purpose of having blast designs is largely served by their advance preparation and submission to the regulatory authority. Such submissions increase operator accountability and demonstrate compliance with performance standards. As indicated above, ~~OSM does not believe that submission of detailed designs is necessary in the permit application to assure safe blasting in accordance with the performance standards.~~

Section 780.13(b), which has been adopted as proposed, provides that each application must contain a description of any system to be used to monitor compliance with the standards of § 816.67, including the type, capability, and sensitivity of any blast monitoring equipment and proposed procedures and locations of monitoring.

One commenter objected to listing capability and sensitivity of blast monitoring equipment in the description of the monitoring system to be used. OSM believes that this is important in assessing control of adverse effects, since the degree of sophistication and complexity of instruments may result in additional data by which to evaluate the damage potential. Seismographs can vary in type, capabilities, complexity of data records, and analytical ability. Therefore, the monitoring system used, including capabilities and sensitivities, may assist the regulatory authority in setting allowable limits for each blasting plan. For instance, operators using instruments with sensitivity to low

frequency airblast (concussion) could be given different airblast limits than operators using less sensitive equipment. This could occur because one instrument's range will include more sound levels, whereas a less sensitive instrument might ignore some low frequency noise. It is also important for the regulatory authority to know the type and sensitivity of equipment in order to evaluate the information it receives.

Commenters objected to the proposed deletion (from OSM's previous rules) of the requirement that an operator specify the procedures by which an operator will meet recordkeeping requirements. OSM proposed to delete the list of data from § 780.13(b) because that data is required by § 816.68. OSM believes that the recordkeeping procedures set out in §§ 816.68 and 817.68 are sufficient to ensure that the records are complete and adequately kept. A further requirement that the operator indicate how the operator intends to keep such records would be unnecessarily repetitive. The rule adopted today, at § 780.13(a), continues to require an explanation of how the operator intends to comply with § 816.68. All that has been removed is the specific list of information the blasting plan must include. Therefore, Section 507(g) is satisfied without regulatory redundancy. False or inaccurate recording of information will be handled through enforcement of § 816.68 or § 817.68. Commenters raised questions about the ability of blasters to keep records without an adequate knowledge of terms. Knowledge of terms and the ability to keep records would be evaluated in the context of training, examination, and certification of blasters. (This is governed by 30 CFR Chapter VII, Subchapter M.) For permitting purposes, it should be sufficient to show that blasts will be conducted under the direction of certified blasters. Accordingly, OSM adopts no rule in Part 780 requiring operators to demonstrate a knowledge of blasting terminology prior to permitting. However, such a demonstration can be included as a facet of the certification program.

Commenters objected to deletion of previous § 780.13(f) requiring that the operator define what specific conditions might require deviations from blasting schedules. Control of all blasts should be under the cognizance of certified blasters who will be trained in recognizing and handling hazardous conditions. Trying to anticipate all potentially hazardous situations is nearly impossible since many may not

occur or be discovered until after mining commences. Furthermore, variation of potentially dangerous conditions may warrant alternative action to that specified in a permit application.

Other commenters suggested that the description of the monitoring system required by proposed § 780.13(b) be optional or be submitted only if required by the regulatory authority. In proposing that portion of the rule OSM intended to leave discretion available to the regulatory authority under §§ 816.67(d) (1), (2), and (4) as to whether monitoring systems will be used or if an equation could be used instead. OSM did not intend to require monitoring of all blasts nor monitoring where none would be needed.

OSM has slightly reworded the final rule in §§ 816.67(d) and 817.67(d), adopting the suggestion offered by one of the commenters so as to avoid the appearance that monitoring is mandatory in all cases. (No seismic monitoring is required if ground vibration limits are set using the scale-distance equation of § 816.67(d)(3) and 817.67(d)(3).) However, if a monitoring system will be used, the permit application must contain its description.

OSM's proposed language at § 780.13(c) required additional information on blasts to be conducted within 1,000 feet of certain structures or 500 feet of underground mines. Several commenters objected to inclusion of regulatory provisions which limit blasting within 1,000 feet of certain structures and 500 feet of underground mines. OSM believes that such provisions are necessary and that ensuring proper blast design is important in these sensitive areas. If properly implemented, blast design will prevent damage to structures or underground mines. In addition, requiring blasting operations within 500 feet of active underground mines to be approved by both the regulatory authorities concerned with surface mining regulations and with the health and safety of underground miners will help guard against potential hazards of such blasting to underground miners.

A commenter recommended limiting the applicability of the 500-foot provision from underground mines to active mines, excluding abandoned workings. OSM has accepted this comment with respect to the joint approval requirements included in revised § 780.13(c). The language of the proposed rule has been revised to require the approval of the State and Federal regulatory authorities for health and safety of mines. Other mine safety and health agencies as well as MSHA

may be involved since many States have counterpart agencies with responsibility for health and safety of mines. The language adopted tracks the requirement set forth in Section 515(b)(12)(A) of the Act. There are no specific underground mining activities associated with abandoned underground mines that must be coordinated with surface mining activities. If an abandoned underground mine becomes active, the requirement for joint approval of the blasting would immediately become effective. This change does not preclude MSHA involvement, but provides for joint approvals by all agencies involved. OSM does not agree with the commenter with respect to limiting the submission of blast designs to active underground operations. This comment is further discussed below under § 816.61(d).

Blast design need not be part of the permitting requirements; therefore the requirement of blast designs has been moved into the performance standards section. These designs require a great deal of factual information which may not be developed until mining approaches these critical areas. Accordingly, while OSM has decided to adopt these blast design requirements, they will be included in the performance standards for blasting, rather than permitting. These rules and comments thereto are discussed below at §§ 816.61 and 817.61. OSM also hopes that this restructuring of the rule will eliminate any concern with respect to the performance standards and the unsuitability criteria of Section 522 of the Act. The provision for blast designs when blasting close to certain structures or underground mines is not a prohibition of mining, as previously found invalid by *In re: Permanent Surface Mining Regulation Litigation, supra*. Rather it is a requirement imposing additional standards where the greatest potential hazards exist. The requirement for additional compliance data when blasting within these limits is based on Sections 515(b)(12), 515(b)(15) and 516 of the Act (See also Roth and others, 1977).

Also in the above case, industry challenged OSM's authority to issue regulations governing blasting. OSM believes that it has such authority based upon the reasoning set forth in its brief to the U.S. Court of Appeals for the District of Columbia in the above case.

Section 816.11. Signs and markers. OSM proposed to delete the requirements of § 816.11(f) relating to blasting signs because its provisions would be duplicative of those in

proposed §§ 816.66 and 817.66 or duplicative of rules of the Mine Safety and Health Administration. OSM is adopting these changes as proposed.

Commenters objected to the deletion of § 816.11(f) because, according to them, it was necessary to meet the requirements of Section 515(b)(15). OSM believes that the provision for flagging charged holes is chiefly designed to protect mine workers and it would be duplicative to require a second flagging provision in OSM's rules. The Mine Safety and Health Administration rules are adequate to protect mine workers and will also provide protection of other persons who may enter the property. § 816.61(a) requires compliance with all applicable State and Federal rules, which include those set by MSHA at 30 CFR 77.1303(g).

Section 816.61. Use of explosives: General requirements. OSM proposed to change the phrase "person who conducts surface mining activities" to "operator" in this section and throughout the blasting rules. OSM received no negative comments on this change. Accordingly, the change has been adopted as proposed.

Section 816.61(a)

Section 816.61(a) requires operators to comply with all State and Federal laws governing the use of explosives. One commenter indicated that proposed § 816.61(a) gave the regulatory authority power to enforce laws and regulations beyond those authorized by the Act. Section 515(b)(15) requires that general performance standards ensure that explosives are used in compliance with existing State and Federal law. In addition, provisions of Section 515(b)(15)(A) through (E) authorize requirements that are supplemental to existing law. Thus, OSM has the authority under the Act to require compliance with other State or Federal laws regarding the use of explosives in conjunction with any applicable regulations implementing those laws. This is not a change from OSM's existing rule or its existing authority.

Section 816.61(b)

OSM proposed no change to § 816.61(b). That section, which requires a schedule for blasts that use more than 5 pounds of explosives, is adopted without change. The blasting schedule requirements are discussed below at § 816.64.

Section 816.61(c)

OSM proposed in § 816.61(c) to retain the requirement that a blaster certified under Subchapter M of 30 CFR Chapter VII be responsible for all blasting

operations. Among those activities cited both in existing § 816.61(c) and in the proposed rule were transportation, storage, and destruction of explosives within the permit area. Commenters suggested deleting transportation, storage, and destruction of explosives from the identified activities. Section 515(b)(15) of the Act requires that explosives be used in accordance with existing State and Federal laws; OSM believes that this includes the transportation, storage, and destruction of explosives. This section was revised in the blaster certification rule which was issued together with this final rule. (See 48 FR 9486, March 4, 1983.)

Section 816.61(d)

OSM proposed in § 780.13(c) to require designs for blasts to be conducted within 1,000 feet of buildings used as public buildings, dwellings, schools, community or institutional buildings or within 500 feet of an underground mine, to be included in the permit application. As discussed above, OSM has determined that this information is more properly obtained in conjunction with the performance at individual blasting operations and is therefore adopted as part of the performance standards for blasting in new § 816.61(d). Operators may continue to submit blast designs as part of the permit application, but may also do so at a later time prior to the blast as approved by the regulatory authority.

This new § 816.61(d) requires that additional design information must be provided when blasting will be conducted within 1,000 feet of any building used as a dwelling, public building, school, or community or institutional building or within 500 feet of an underground mine. Some commenters felt that the requirement that operators submit typical blast designs within 1,000 feet of buildings or 500 feet of underground mines was prohibited according to Judge Flannery's decision. *In re: Permanent Surface Mining Regulation Litigation, supra*. These commenters also felt that a typical design requirement would be unnecessary and is irrelevant.

OSM disagrees. As described above, Judge Flannery's decision struck down OSM's attempt to prohibit blasting within these areas. The rule adopted today does not prohibit blasting within 1,000 feet of buildings or 500 feet of underground mines. Rather it requires the operator to take extra steps in these areas to help ensure the prevention of damage. In this context, blast designs can be a useful tool. They assure adequate planning and, together with

the required direction by a certified blaster, ensure proper implementation. They allow regulatory authority involvement if necessary and provide a record if problems should occur.

The rule requires that the operator submit information outlining specific precautions to be taken and criteria to be implemented. Sketches of drill patterns, delay periods, and decking and the type and amount of explosives to be used, critical dimensions, and the location and general description of structures to be protected will be submitted. Thus, where the damage potential is highest, the regulatory authority will have the greatest information to ensure adequate protection.

The 1,000-foot distance has been selected so that the operator is alerted that special precautions are necessary to prevent property damage and personal injury when conducting blasting operations within this distance. The blast design required when blasting within this area: (1) Provides a preblasting record of the blast design, (2) provides notification to the regulatory authority so that monitoring may be scheduled if appropriate, and (3) ensures that a certified blaster has developed a specific blast design for such blasting. The requirement that a certified blaster prepare and sign the design imposes on the blaster the responsibility for designing the blast in a responsible manner. It also assures that a competent professional has designed the blast.

A commenter recommended limiting the 500-foot provision from underground mines to active mines, excluding abandoned and collapsed workings. The blast design requirement provides for extra protection when blasting near underground mines and recognizes the sensitivity of all these structures in accordance with Section 515(b)(12) of the Act.

Other commenters suggested changing the proposed requirement for "specific" blast designs to "standard" or "typical" designs to indicate the acceptability of a typical engineering design solution rather than submitting a series of specific designs and later amending these based on site-specific conditions encountered. Although the words "standard" or "typical" are insufficient to tie the design to the specific blast, OSM believes that the intent of this section will be preserved by using the term "anticipated" rather than "specific." Using the term "anticipated" will allow operators the flexibility to change the designs based on unexpected conditions encountered at particular sites without having to resubmit the

designs to the regulatory authority. To the extent a single design is intended to be used on more than one occasion, it need not be submitted more than once, although each blast for which it is used should be identified.

Some commenters believed that the blast design requirement would be duplicative of the record required by § 816.68. OSM, however, believes that both are important; one is necessary for implementing the blast properly, and the other for postblast analysis. As in other professions, the use of a detailed design better ensures its completion. OSM recognizes that formal submission of written blast design is more stringent than other operating practices, but believes that appropriate additional protection will be afforded by such submissions, particularly when mining operations are conducted in residential or inhabited areas.

One commenter objected to the provision in proposed § 780.13(c)(2), that a blast design may be submitted at some time after the initial permit application, because the public may not be afforded adequate participation. OSM believes that the blast design is best submitted at the time when an area is ready to be mined. The rule, adopted in § 816.61(d)(2), allows the regulatory authority to specify a particular time for design submittal. The intent of the design is not primarily for public or regulatory review; rather it serves as a tool for the operator, blaster, and the blasting crew to understand the blast layout and implementation and for the regulatory authority to be advised of the blast parameters and timing, to initiate monitoring, if appropriate, and to ensure compliance with performance standards.

Proposed § 780.13(c)(5) would have allowed the regulatory authority to require a change in the blast design. This has been adopted in § 816.61(d)(5). Some commenters stated that no benefit would result from regulatory authority revision of blast design. OSM recognizes that the certified blaster must retain primary design responsibility. However, the regulatory authority should have the authority to require changes in the design if it believes that required performance standards will not be met.

Commenters felt that proposed § 780.13(c)(6), which required 30-day notice to property owners whose structures are within 1,000 feet of the blasting site, would conflict with § 816.64(b) which requires similar notice via blasting schedules. OSM agrees and has chosen not to adopt the requirement proposed at § 780.13(c)(6).

Section 816.62. Use of explosives: Preblasting survey.

Section 816.62(a)

A number of commenters requested specific time frames for requesting and conducting preblasting surveys. OSM had originally proposed to have notification of the availability of preblasting surveys distributed with the blasting schedule. In response to the comments, a provision has been added as § 816.62(a) which requires an operator, at least 30 days prior to the initiation of the blasting, to notify in writing residents within one-half mile of the permit area of the procedures for requesting a preblasting survey. This notice may be accompanied by a copy of the blasting schedule. The 30-day notice requirement is set to give a resident sufficient time to request a survey and an operator adequate time within which to complete the survey. This change has been made because OSM agrees with those commenters who believed that it is feasible for preblasting surveys to begin earlier than blasting schedules are set. Preblasting surveys may be conducted independently of the actual blasting schedules. Furthermore, the earlier such surveys are requested and completed, the more flexibility the operator will have in scheduling blasts.

Several commenters requested that time limits be placed on preparation of preblasting surveys and for the filing of disagreements. The rules as adopted require operators to provide property owners or residents at least 30 days of notice for requesting blasting surveys, and to promptly complete the survey upon request. Section 816.62(e) has been added to clarify that for those surveys that have been requested at least 10 days prior to the scheduled initiation of blasting, completion of the survey is required prior to the initiation of blasting. If a survey is requested less than 10 days prior to the scheduled initiation of blasting, the operator should take all reasonable measures to complete the survey in a timely manner. Individual regulatory authorities may impose additional time limits if appropriate for the region or locale. OSM has declined to attach a time limit within which to file disagreements. Such a time limit would not necessarily serve the regulatory process. However, it should be recognized that disagreements which are filed promptly or prior to the start of blasting will be more likely to be satisfactorily resolved between the operator and resident than those filed long after the report has been completed and blasting has begun.

Section 816.62(b)

Section 816.62(b) of the final rule allows the owner or resident of a manmade structure within one-half mile of the permit area to request the operator to provide a preblasting survey by writing directly to the operator or to the regulatory authority, who then will request the operator to conduct the survey. Although one commenter objected to this proposal, OSM believes it provides needed flexibility and could expedite the preblasting survey process. An operator is required to conduct the survey promptly and to promptly prepare the report.

Another commenter objected to the requirement for requesting surveys in writing, citing previous preambles as allowing verbal requests. Although the Act does not mandate written requests for a survey, it is the best method to provide control over the request and survey production process, without placing undue burdens on the regulatory authority manpower or on persons requesting surveys. Moreover, the written request will serve as a verification of the request and trigger action by the operator in timely conduct of the survey.

Updated surveys may be requested by the owner or resident at any time. If a structure is enlarged, renovated or modified after a survey is completed, an update to the preblasting survey must be performed if requested.

Other commenters believed that the second sentence of Paragraph (b) should be rewritten to clarify the roles of the requester, the operator, and the regulatory authority in requesting, initiating, and conducting preblasting surveys. OSM has accepted these comments and has edited the sentence slightly to help clarify its intent.

A commenter indicated the need to include owners of property such as pipelines, water wells, and utility towers in the list of those notified for preblasting surveys. OSM does not consider the language of the Act or the rules to limit the preblasting survey to residences or buildings. Section 515(b)(15)(E) of the Act refers to manmade structures and therefore includes any structure such as dams, utility stations, pipelines, etc.

Commenters suggested that the proposed system of preblasting surveys would not protect operators from false damage claims. As a solution they suggested operators should have the right to request preblasting surveys. The preblasting survey provisions of the Act only provide the owner or resident the opportunity to request preblasting surveys. If the operator wishes to

conduct a survey, a specific request could be made to the owner of the particular structure. If concern of false claims persists where a property owner does not request or refuses to allow a preblasting survey to be conducted, the operator should ensure that the blasting is carefully monitored.

Commenters objected to the requirement of a preblasting survey within one-half mile of a "permit area" while other requirements, such as notification in proposed § 816.64(b)(2), were keyed to the "blasting site." All blasting sites are contained within a permit area. Section 515(b)(15)(E) of the Act offers every resident or owner within one-half mile of any portion of the permit area the opportunity for a preblasting survey. Therefore, OSM has adopted the regulatory provisions which gives all owners and residents within one-half mile of the permit area the opportunity to receive a preblasting survey before blasting begins on any portion of the permit area. OSM believes that any other regulation would conflict with the language of the Act.

Section 816.62(c)

Under § 816.62(c) as adopted, preblasting surveys will address the condition of the structure and document any preblasting damage or structural defects. Assessments of structures such as pipelines, cables, transmission lines, and wells, cisterns, and other water systems will be required, but such assessments may be limited to surface conditions and other readily available data. The person conducting the survey must give special attention to such water systems and should document all available data and determine whether such additional analysis is appropriate, based upon the significance of the water system, its vulnerability, and the availability of data.

Commenters objected to OSM's proposal to require that special attention be given to water wells because recent studies have proven that blast vibrations have little effect on water quantity and quality. Other commenters believed that assessment of quality and quantity of water is essential in surveys involving wells. Such information is believed important for both the user and the operator, since hydrologic impacts can be caused both by mining and blasting. The degree of detail may be determined for each case by the regulatory authority, depending on the nature and amount of water or structures involved. Based on these comments the last sentences of § 816.62(c) have been rewritten to clarify OSM's intent.

Section 816.62(d)

Section 816.62(d), which was proposed as § 816.62(c), requires the person completing the survey to sign it and provide a copy of the report to the regulatory authority and the person requesting the survey. This section also allows the person who requested the survey to note disagreement with the contents by submitting a written detailed description of the disagreement.

A commenter requested that the owner or resident sign the preblasting survey indicating concurrence. OSM declines to adopt such a requirement which it believes is unnecessary. OSM believes that allowing residents or property owners to file their disagreements is adequate.

OSM's proposed rules had specified that the original of the survey be provided to the regulatory authority. Commenters suggested that either a copy or the original be provided to the regulatory authority. OSM accepts this suggestion and has adopted appropriate regulatory language.

A commenter objected to the omission in the proposed rule of a mechanism to resolve disagreements in survey data. OSM declines to adopt this suggestion. OSM believes that the regulatory authority is responsible to insure that blasting surveys are complete and accurate. Further, the regulatory authority could direct that inadequate surveys be redone. However, OSM does not believe it necessary to require that any disputes be resolved by the regulatory authority, but only that the survey, including the description of disputed results, should serve as a record of the condition. It should be noted that the regulatory authority could take appropriate action to ensure that surveys are complete and if a serious potential danger exists could incorporate restrictions into the blasting plan and performance standards.

Section 816.64. Use of explosives: Blasting schedules. The title of new § 816.64 has been shortened to "Use of explosives: Blasting schedules" as was proposed.

Section 816.64(a)

OSM has revised § 816.64(a)(1) to clarify the fact that the regulatory authority may limit the timing of blasts, the area covered by a blasting schedule, and the sequence of blasting. The proposal only mentioned limitations pertaining to hours per day, times per day, or number of blasts per day. As adopted § 816.64(a)(1) will allow blasting only at times approved by the regulatory authority and announced in

the blasting schedule. The regulatory authority's decision restricting blasts must be justified on the basis of public health and safety or welfare. OSM has not adopted the proposed requirement that limitations on blasting be based on written submissions only. However, every determination must have an adequate basis.

OSM believes that prevention of excessive noise, especially in populated and residential areas, is within the ambit of "health and safety or welfare." Thus if noise from blasting will disrupt nearby residents, blasting may be limited to times which create the least discomfort. OSM believes that certain site-specific conditions, such as residential surroundings, may require prohibition of nighttime blasting. The final rule has been revised to require such prohibitions, if conditions warrant.

Several commenters objected to the proposed removal of regulations absolutely limiting the times of blasting (previous §§ 816.64(b)(2)(ii) and 816.65(a)) or the blasting area (previous § 816.64(b)(2)(i)). The old rules set absolute limits on the number of hours per day, nighttime blasting, and the size of an area covered under one blasting schedule. OSM recognizes that such limits may be useful under some conditions. For this reason OSM has decided to retain the requirement that blasting be conducted between sunrise and sunset. That requirement is contained in § 816.64(a)(2). The final rule provides flexibility to the regulatory authority to impose more restrictive time periods or to allow nighttime blasting based upon a showing by the operator that the public will be protected from adverse noise and other impacts.

OSM does not believe, however, that national limits on the size of the blasting area or number of hours of blasting per day are necessary. The final rule deletes the prior absolute constraints of 4-hour aggregate amount of blasting per day, and 300-acre maximum blasting areas. These standards presented limits which in some cases were arbitrary or too stringent for an operator to develop an effective schedule. Individual regulatory authorities may impose such restrictions or other more stringent limitations on a site-specific or statewide basis as appropriate. Restraints on the total time of blasting is more a function of planning. The blasting schedule is required, and adherence to the schedule is expected. The regulatory authority must review and approve the times for blasting in the blasting schedule. To make the schedule work, the operator must control production, loading, delivery, and other physical factors to

meet his schedule. Where the regulatory authority determines that blasting should be limited, it should impose such limits. In the absence of such a determination, the operator must conform to the approved blasting schedule.

OSM had proposed to relax some restrictions governing unscheduled blasts. Commenters objected that the specific restrictions on unscheduled blasting were omitted. In some instances, such as unusual weather conditions or unavoidable delays, public or operator safety may dictate unscheduled detonations. Obviously, where public or operator safety so require, unscheduled blasting is appropriate. However, OSM has declined to adopt the portion of the proposal which would have allowed unscheduled blasts in nonemergency situations. Thus, while OSM recognizes that some blasting activities such as the construction of roads or the creation of faceups are nonperiodic, these nonemergency blasts should be planned, scheduled, and announced in advance in the blasting schedule. Thus, § 816.64(a)(3) allows unscheduled blasts only in emergency situations. However, schedule changes for nonemergency blasts may be made between 10 and 30 days before blasting begins under § 816.64(b)(3).

Because unscheduled blasts will only be conducted in emergency situations, OSM has adopted the requirement of notification of all residents within one-half mile of the blasting site when unscheduled blasts will occur by requiring that audible notification take place. This allows for more efficient notification of every one within one-half mile, and such notification can be provided more quickly. Commenters expressed concern that in emergencies such as adverse unexpected weather conditions it might be impossible to notify all residents orally. Accordingly, in these situations, audible signals may be used.

Some commenters suggested adding a provision for the resolution of disputes with regulatory authorities regarding blasting schedules.

Apparently, the commenter was concerned with possible problems caused by disapproval of proposed blasting schedules. OSM believes that no such provision is necessary. In making the determination to restrict blasting, the regulatory authority must determine that such limits are reasonable and necessary in order to protect the public health and safety and welfare. OSM believes that standard is

sufficiently objective to minimize disputes.

Section 816.64(b)

OSM is adopting paragraph (b)(1) of § 816.64 and most of paragraph (b)(2) as proposed. These require newspaper publication of the blasting schedule between 10 and 30 days before blasting is to begin and set the requirements for distribution of the blasting schedule to local governments, public utilities, and residences within one-half mile of the blasting site. The term "blasting site" here is the area formed by the perimeter of the blast holes.

One commenter felt that publication of a blasting schedule 10-30 days in advance would be too difficult. He suggested that production schedules could not be set that far in advance. OSM believes it is important for operators to undertake sufficient planning and preparation so that they know their schedule with sufficient certainty to allow publication of schedules well in advance. Accordingly, OSM has adopted the requirements as proposed.

OSM had proposed that information on how to obtain preblasting surveys should be provided when copies of the blasting schedule were distributed. OSM received comments that 10-30 days were insufficient to conduct preblasting surveys. Both operator and regulatory authority commenters felt that additional notification of the availability of preblast surveys should be provided. Accordingly, OSM has provided that notice of availability of preblasting surveys may be distributed separately from and earlier than the blasting schedule. As discussed earlier, preblasting survey information is required to be distributed according to § 816.62(a).

Notification of blasting as required by Section 515(b)(15)(A) of the Act and by the regulations is provided by three methods: (1) Schedules published in newspapers, (2) schedules delivered to persons living within one-half mile of the blasting site, and (3) daily notification of blasts through audible signals to locations within at least one-half mile of the blasting site (required by § 816.66(b)).

Section 816.64(c)

Section 816.64(c), setting forth the blasting schedule contents, is adopted as proposed. As indicated above, the final rule removes the constraints of 4-hour aggregate per day, daylight-only blasting (upon approval of the regulatory authority), and 300-acre blasting areas. Such restrictions may be